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New Curricula for Soviet Schools

The Future Soviet City: A Series of Articles

Expressionism in Music — Real and Imagined Leon Danilevich

The Subconscious, Dreams and Intuition:

A Materialist View G. I. Kositsky

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Psychological Preparation of Elementary School Pupils for Work

By A. A. Lyublinskaya

The Soviet educational system places great emphasis on instilling positive work attitudes beginning with the earliest grades at school. This article, taken from an elementary school journal, discusses some of the methods used to shape these attitudes. The author is a Professor at the Herzen Teacher Training Institute, Leningrad. (*Nachalnaya Shkola*, 1960, No. 6.)

The new School Law says: "It is necessary, beginning with the early years of instruction, to prepare children for socially useful work in the future."

Before outlining concrete ways and means of doing this it would be advisable to define what we mean by psychologically preparing children for work. This general aim includes the following points:

1. Teaching children more about the work people do.
2. Teaching them particular habits and skills and a general method of work activity.
3. Developing a positive attitude toward work and an urge to work.
4. Promoting the general physical, mental and moral development of children.

Let us consider each of these points.

I. More knowledge. To want, like or strive for something you must have a good idea of both its positive and negative features. The deeper and more complete this knowledge, the better and more stable will be the child's attitude toward what is good and what is bad.

It is impossible to develop in children age 7 to age 11 a desire to participate in the work of adults if they have only a vague

idea about it. They know, of course, something of the work the adults around them do. In the 1st to 4th grades they are familiarized with certain trades and professions. Their knowledge comes chiefly from their readers, discussions of pictures shown in class and school excursions where they see people actually at work. But this usually does not add much to what children already know about different types of work. There is no system to this knowledge, nor does it have the depth which children of the 1st to 4th grades can grasp. Hence, their attitude to work and people who work develops in a superficial and passive manner.

In discussing the work of their mothers with pupils of the 2nd grade (in connection with International Women's Day, March 8) we received answers which showed how very superficial the children's knowledge was. When we asked where mother worked and what she did, children said: "My mother is a nurse. She takes people's temperatures and gives them medicine." "My mother is an engineer; she walks about the factory and gives orders." "My mother is a traffic regulator. She stands on the street and waves her arms." "My mother is a school principal. She sees to it that children don't come to school late." "My mother doesn't do anything." ("She doesn't have a job?" "No." "What does she do at home?" "Nothing.")

No wonder that, with few exceptions, the children considered the work their mothers did easy, "that it isn't hard for mother to work." This is natural. When children know little of what their parents do it is difficult to teach them to respect and be considerate to their parents.

The children's attitudes began to change after the class learned in more detail about the work done by a traffic regulator, telephone operator and cook: the boy, who had said his mother (the mother of a large family) did nothing, soon discovered that she was busy every day of the week, including Saturdays and Sundays. The children realized the significance of their mothers' work and felt a desire to help them.

To give them a clear idea of what kind of work people do children should be taught the following:

1. Where stonemasons, carpenters, weavers, doctors, bookkeepers, etc., work.
2. What tools, instruments and machines are used in working, how they are used, and what materials are processed. There is no need, of course, to describe the design of a lathe, instrument

or machine. It is enough to tell children how machines help people and what a worker has to know to be able to operate machines. Here it is very important to show children the conditions under which work is performed.

3. Where the products made by skilled workers actually go. Just telling the children is less convincing and definite than showing them. It is desirable to show children, for example, the machines factory workers produce, how they are packed into large cases, how giant cranes load them onto railway flatcars, and how they arrive in other towns; or how stockings and socks are knit and sent to the stores for sale.

4. What the pleasures and values of a person's work are and what its concrete importance is for the general development of our country, in industry, construction and transport.

5. What makes work difficult and complicated, and what it demands from each person.

6. Whom the work of a skilled worker benefits and whose work he himself constantly utilizes. (This is very important in giving children a definite system of knowledge.) You can turn this into a game in which the children name a worker and then try to think of all his connections with other workers. "A street-car driver drives a streetcar. His work benefits people because it enables them to get to work, to the theater or to the doctor. The driver wears a uniform; the uniform was made for him by women at a clothing factory. The cloth for the uniform was made at another factory. The driver's children go to school or attend kindergarten where they are taught by teachers. The driver buys bread which is baked at a bakery. He goes to the movies where he is sold a ticket by a girl at a box-office and sees a motion picture."

As children discover the relationships among workers they come to the natural conclusion that they must not benefit from the labor of other people unless they contribute their own labor to the common cause. The children quickly decide that when they grow up they will also work because they must eat, dress, go to the movies, read books, and so on.

Besides enriching and deepening the child's knowledge of work this method also makes it more systematic. It becomes the foundation for the child's first comprehension of the significance of work.

Since children can be shown a very small number of trades

and professions to increase their knowledge of different types of work, specially selected stories may be employed with success to teach them about work. S. Baruzdin's *Who Built This House?* and Mayakovsky's poem *What Shall I Be?* may be recommended for this purpose.

The job of enriching and deepening children's knowledge must become more and more complex as they pass from grade to grade. This is not only because the amount of knowledge acquired increases. The transition from passively acquiring knowledge to using it actively and creatively under new conditions in solving new problems, both practical and theoretical problems, plays a significant role here.

II. Any sort of work makes a demand on your mental capacities. No matter how simple the work, you must know how to plan it, estimate the time it will take, and determine the sequence in which you will perform the separate operations and apply separate skills. You must acquire materials and tools, and to do this you must look ahead and plan the entire job. You must know how to organize the work and distribute it among all the members of the group, taking into account the capabilities of each pupil. It is obvious that such skills can never be made automatic. On the contrary, they require greater and greater mental activity and a constant improvement in the general method of working, that is, they require learning a number of increasingly complicated intellectual skills.

In the 1st grade the child is taught not only how to count but also how to arrange his arithmetic problems or drawings on a sheet of paper. He is not only taught the technique of reading but he acquires the habit of studying from a book, of reading it, understanding the text, comparing it with the illustrations and selecting the essence of the story.

A special role is played by certain definite habits which the teacher tries to instill in the child beginning with the 1st grade: the habit of keeping his desk tidy and his books, notebooks and other study material in order; the habit of getting down to work without delay; the habit of concentrating while doing his lessons and not allowing himself to be distracted by the presence of people or by a certain amount of noise; the habit of finishing what he begins; the habit of keeping to a definite routine, of working at an even pace, and many others.

When Ushinsky said that the main purpose of elementary

education was "to teach the child to study" he meant, of course, not only developing certain simple actions and habits in the child but teaching the child the complex skills and useful habits that are the foundation for any type of work activity, including special mental activity.

The rational skills and work habits which the child acquires in elementary school develop into character traits. Orderliness, the ability to concentrate, efficiency, the ability to switch quickly from one type of work to another, a critical approach to one's own work and the work of others, and many other traits are developed in different kinds of school activity—in study, work and social affairs—in more and more complex forms.

Thus, mastery of skills and development of useful habits are necessary conditions for the psychological preparation of children for work.

III. Preparing children to work includes development of one of man's most valuable qualities, industry. Industry is expressed, primarily, in the feeling of deep satisfaction a person experiences when he is working on something needed by and useful to other people or himself.

Whether children make a garden in the school-yard, put out a wall newspaper, wash their handkerchiefs and collars, or tidy up their classroom, all these activities are a source of real joy to them and produce the most positive emotions. It should be especially emphasized that the joy of working comes not only from what is accomplished by collective activity. The process of working itself, which requires healthy exertion, effort, initiative, determination, inventiveness and stamina, gives tremendous pleasure. It is worthwhile recalling that one of the specific features of man's attitude to reality is that it is not passive but active. It was Marx who said that man apprehends the world by changing it. Transforming objects through his own efforts, his own activity, is a source of joy—the joy of creativeness and construction—to the child at all stages of his development.

Work is a transforming activity. For this reason there is nothing surprising in the fact that doing something really useful that is within his powers is satisfying to the child. He rejoices in the results of his work, in the effort he puts into overcoming difficulties, in the interest that stems from trying out new ways of doing things and applying his knowledge, and from looking for the best way of performing his job.

Makarenko correctly pointed out that when you entrust a difficult job to a person you show respect for his ability. Work which does not require searching and effort will not arouse much interest in the child. Neither will work which is too difficult, requiring too great a physical and nervous effort.

Work should not be so easy that the child can play at it and accomplish it without making any particular effort. At the same time, it should be work which is within his powers and for which he has the training, knowledge, skills and will-power. The joy that comes from healthy effort and something achieved, when it is reinforced by praise from teacher and comrades, stimulates the child to tackle an equally difficult task the next time.

The feeling of satisfaction from a work effort also comes from the joy of group activity. Association in work is the basis for teaching children genuine comradely relations and cooperation.

Industry, however, involves more than the child's positive attitude toward work. Industry is also reflected in the child's ability to value time, in his efficiency and his responsibility for the quality of his work, in his respect for the work of other people and his intolerance of laziness, idleness and irresponsibility.

The child is thus taught to feel the need and desire to participate actively in socially useful work in which he must make a certain effort; he develops respect for work and those who perform it. Finally, he learns to pass a correct judgment on the industrious and the indolent, on diligence and laziness.

IV. Preparation for work includes the child's physical, mental and moral development. This is clear from everything that has been said above. The child must reach a certain level of physical development before he can take an active part in collective work.

If the child's muscles are flabby he cannot make the necessary work movements with sufficient physical strength, agility and precision to maintain the necessary work positions.

Children learn to coordinate their movements at lessons in manual training, drawing, physical education and nature study, during work on the instructional-experimental farm plot, and in doing things like measuring, building, etc.

The tremendous part played by mental development, by thinking, is obvious. Unfortunately, the tendency to rely mainly on the child's memory has not yet been overcome in school in-

struction. Teachers, instructors in teaching methods and educators have been working in recent years to stimulate greater activity and independence in pupils' work. Thinking starts when some problem has to be solved. It cannot be solved by simply recalling a rule. The child must reach an independent understanding of the problem, select from his store of knowledge what he needs in order to deal with it, and apply this knowledge in a new way in the solution of a definite problem.

Thinking is, first and foremost, an analytical-synthetic activity in which the whole is broken down into its parts and various relationships among the parts are established. In anything he does the pupil must know what the main task is, into how many parts it should be divided, in what sequence the individual problems should be solved, what operations and methods should be used, and what should follow what. A way of checking up on the results of the solution of each problem has to be found, and so on.

These requirements, which are made of any job that has to be done, whether physical or mental, mean that the child should learn the general method of mental activity, that is, should be taught how to analyze the job at hand and carry it through in organized fashion.

* * *

Valuable moral qualities are developed in the well-organized daily life of the child, including the child in the younger age groups. These qualities constitute one of the essential aspects of his preparedness for work. They include conscientiousness; a sense of responsibility for the quantity and quality of the work done and the time limit within which it is to be done; the ability to organize one's work and maintain a high level of self-discipline, cheerfulness and a healthy feeling of confidence in oneself and one's comrades; the ability to make an effort of will and to maintain self-control.

Psychological preparation for work, for independent life and for diversified activity, is essential for the child's full development.

New Curricula for Soviet Schools

This article presents data on recently adopted curricula for (a) eight-year schools at which attendance is to be compulsory for all children between the ages of 7 and 15-16; (b) daytime secondary schools corresponding to the 9th, 10th, and 11th years of education; and (c) evening secondary schools (also corresponding to the 9th to 11th years of schooling) for working youth. The seven-year schools referred to in the article are in the process of being converted to an eight-year program. The original article includes pictorial diagrams which are presented below in the form of tables. (*Shkola i Proizvodstvo*, 1960, No. 10.)

In connection with implementing the law "On Strengthening the Ties Between the School and Life and on the Further Development of the System of Public Education in the USSR," the Ministry of Education of the Russian Federation has approved new curricula for the eight-year and secondary schools of the RSFSR.

The eight-year school is the first stage of secondary school education. It is an incomplete secondary, general-education, labor polytechnical school. Instruction in it is obligatory for all children from the age of 7 to the age of 15 or 16.

The eight-year school must provide pupils with a firm foundation of general educational and polytechnical knowledge, must inculcate in them a love for work and a readiness for socially useful activities, and must give children a moral, physical and esthetic upbringing.

The main difference, in principle, between the eight-year school and the seven-year school is that the former simultaneously equips children with a profound mastery of the fundamentals of science and provides them with a system of labor training beginning with the lower grades, which ensures the psychological and practical preparation of pupils for socially useful and productive work.

In order to fulfill these tasks, the curriculum of the eight-

year school assigns 7,296 instruction hours (1,040 hours more than in the seven-year school) for the study of the general-educational and polytechnical subjects, and 1,315 instruction hours for labor training (twice as many as in the seven-year school).

Table 1 shows the distribution of hours provided by the curriculum for the main types of instructional and educational work in the eight-year school.

An analysis of the specific features of this distribution will enable the reader to understand more fully the system of instruction and its possibilities in the first stage of secondary education.

Table I
CURRICULUM IN THE EIGHT-YEAR SCHOOL*
(in hours)

General educational and polytechnical subjects	Labor training and socially useful work	Physical culture, music, singing and drawing
Russian language 2,184	Labor training . 709	Physical culture 566
Literature 357	Socially useful work 426	Music and singing 283
Mathematics ... 1,663	Social production practice 180	Drawing 248
History and Constitution of the USSR ... 391	TOTAL 1,315	TOTAL 1,097
Nature Study .. 105		
Geography 286		
Biology 286		
Physics 249		
Chemistry 142		
Drafting 71		
Foreign language 465		
TOTAL 6,199		

*In the eight-year school 1,040 more study hours have been set aside for the study of general-educational and polytechnical subjects, and twice as many hours for labor training as in the seven-year school. The school has 8,611 study hours for all types of instructional and educational work during the course of the school year.

* * *

The secondary, general-education, labor polytechnical school with production training is designed to give pupils a complete secondary general and polytechnical education with vocational training for work in one of the branches of the national economy or culture on the basis of combining instruction with socially useful production work by the pupils.

That is why the curriculum for this school devotes two-

thirds of the school time in the 9th to 11th grades to the study of the general-educational and polytechnical subjects and one-third of the time to production (theoretical and practical) training and the productive work of pupils.

Furthermore, in addition to the standard instruction hours, 226 hours are provided for optional studies, which should have as their aim a more profound study of the specialties selected by pupils.

Table 2 shows the distribution of the study hours according to the main types of instructional and educational work of the city secondary school with production training.

Table II
CURRICULUM OF THE CITY SECONDARY SCHOOL
WITH PRODUCTION TRAINING
(9th, 10th, and 11th grades, in hours)*

General educational and polytechnical subjects		General technical subjects, production training and production work	
Literature	339		
Mathematics	452		
History	335		
Constitution of the USSR...	70		
Economic geography	148		
Physics	382		
Astronomy	39		
Chemistry	265		
Biology	117		
Drafting	78		
Foreign language	261		
Physical culture	226		
TOTAL	2,712	TOTAL	1,356

*The school has 4,068 study hours during the school year for all forms of educational and instructional work. Furthermore, 226 study hours have been assigned to the school for optional studies, the aim of which is to deepen the study of the specialties selected by the pupils.

The curriculum of the *village secondary school with production training* differs somewhat from the curriculum of the city secondary school.

Although the same general-educational subjects are studied in the village, for four of them from 3 to 15 hours more are assigned, and for the other eight subjects from 1 to 10 hours less are assigned than in the city school.

For instance, in the village school 7 more hours are assigned to the study of economic geography and 15 more hours to foreign languages than in the city school.

The instruction hours for vocational training in the village school are distributed as follows:

1. For the study of the principles of agricultural production and production (theoretical and practical) training—614 hours.
2. For seasonal production work—756 hours.
3. For optional studies—184 hours.

* * *

The evening (shift) general-education secondary school is designed to give those who have finished the eight-year school and who work in various branches of the national economy or culture a complete secondary school education and an opportunity to raise their professional skills.

In order to fulfill these tasks the curriculum of the evening (shift) general-education secondary school devotes 75% of the study time, or 1,620 instruction hours, to a study of the general-education and polytechnical subjects, and 25%, or 540 study hours, for consultation and optional studies which must be directed toward raising the professional skills of the pupils.

Table 3 shows the specific features of the distribution of

Table III

**CURRICULUM OF THE EVENING (SHIFT) GENERAL-
EDUCATION SECONDARY SCHOOL**
(9th, 10th, and 11th grades, in hours)*

General educational and polytechnical subjects	Optional Studies	Consultations
Literature 216	TOTAL 216	TOTAL 324
Mathematics ... 324		
History 162		
Constitution of the USSR ... 36		
Economic geography ... 108		
Physics 288		
Astronomy 18		
Chemistry 180		
Biology 54		
Drafting 54		
Foreign language 180		
TOTAL 1,620		

*The school has 2,160 study hours during the course of the school year for all types of instructional and educational work. The aim of the optional studies and consultations is to raise the professional skills of the pupils.

the instruction hours according to the main types of instructional and educational work in the *evening (shift) secondary school*.

The three tables included here provide the readers of this journal with a clear picture of the main types, character and amount of instructional-educational work in the general-education school.

It would be useful not only for personnel in education and other readers, but for students as well, to become familiar with the new curricula by examining these tables.

In conclusion, it should be noted that the schools will begin working according to the new curricula on the dates established in the instructions of the Ministry of Education of the RSFSR, No. 138, dated May 19, 1959.

In the 1959-1960 school year, in accordance with these instructions, the 1st to 5th grades of all general-education schools conformed to the new curricula. In the 1960-1961 school year the 6th grades will work according to them, in the 1961-1962 school year—the 7th grades, and in the 1962-1963 school year—the 8th grades. Then the transfer of the 9th to 11th grades to the new curricula and programs will begin in the 1963-1964 school year.

Until the transfer to the new curricula and programs is effected, all grades will work according to the existing curricula and programs indicated in the above-mentioned order of the Ministry of Education of the RSFSR.

The Training of 20th-Century Lomonosovs

A Discussion by Dubna Scientists

The town of Dubna is the site of the Joint Nuclear Research Institute, where scientists from China, the German Democratic Republic, Czechoslovakia, Rumania, Bulgaria, Hungary, Albania, North Korea, Mongolia and Vietnam are engaged in atomic research with those of the Soviet Union. Concerned about the education of replacements, these scientists met late last December for a discussion which was called "Young People's Path to Science." The statements made at this meeting by some of the leading scientists who participated are presented below. The title of this series refers to Russia's leading 18th-century scientist and man of letters. (*Izvestia*, December 27, 1960.)

Needed: An Army of Researchers

By M. Meshcheryakov

The training of scientific personnel assumes especially great importance during this period of all-out construction of communism. We need a tremendous army of researchers capable of multiplying the country's scientific achievements.

To talk about training those who shall ultimately take our place means to talk about strengthening the ties between education and science. These ties were partially disrupted while a fight was being waged in our universities and research circles against the holding of several jobs at once. It is a good thing that this trend has been reversed. For the more actively the personnel of research establishments is drawn into the work of higher schools, the easier it will be to find promising young talent.

How are our future researchers to be selected in practice? It is best to pick them by competitive examination for probation-

ary jobs offered on a two- or three-year basis. The contest must be open and honest, and no consideration given family or other ties, sports achievements and the like. None of this must deflect from our main criterion—the presence or absence of talent. The most able of the probationer-researchers will later remain on the staffs of the institutes. Tenure will also be by open competition.

We all know however that institute and college department staffs are limited and as a rule already filled. Here is where we see the need for creating a “canal.” This is not my term; it was coined by Academician Veksler who is present here. Science demands that people without special capabilities who are at a standstill in their development be regularly dropped as faculty members. And we must see to it that talented people working five or six years in a scientific research institution should also be given a chance to participate in the work of the colleges to transmit their experience to the students. Finally it is extremely important that a young specialist should be able to work not in just one but in several scientific establishments on several problems.

Millions of specialists with higher education, among them many talented ones anxious to do research, are now employed in factories, on construction sites and in agriculture. We are duty-bound to find these people and help them. How can we introduce them to the field of science?

I have here a copy of *Izvestia* containing two interesting items. One concerns the manager of a district archive office who at the same time is working as instructor for a district Soviet. On another page there is a story about a group of railway workers giving a performance of *Othello*. These are not isolated cases. What do they tell us?

They show that with the average working day consisting of 6 or 7 hours, with no threat of unemployment, with the standard of living rising and the line of demarcation between physical and mental labor being eradicated, people turn to other socially useful work in addition to their main jobs. That is why I believe that if a person has any inclination towards research he should be given all possible access to scientific work. I am not proposing that the doors of research institutes be opened wide to all kinds of hare-brained dreamers and inventors of *perpetuum mobile*. That is quite a different matter. But good practical specialists with higher education should be able to

maintain ties with institutes, improve their knowledge and keep abreast of the latest scientific achievements.

They should be drawn into the work of seminars, given the use of our libraries and invited to scientific conferences. *We must attain a situation wherein the institutes shall be reinforced by an active contingent of non-staff scientific workers.* This too is one of the ways of finding talented people.

There is another important problem. Professors at many provincial universities giving courses in the physics of elementary particles (I am not referring here to the Moscow, Leningrad or Kazan Universities) never seem to take an active part in the work of this branch of science; they do not conduct investigations on, say, modern accelerators, atomic reactors, etc. Here is where sheer "paper" teaching is born.

Our medical men have arranged things better: at regular intervals they gather doctors from the provinces and teach them new techniques, such as performing operations on the heart. We, too, could undoubtedly organize something on this order. *Why not summer schools for college teachers at leading physics institutes of the Academy of Sciences?* This should be done. Only the scientist who is himself in the front ranks of science has a right to train our scientifically minded youth.

Exercising the Mind

By A. Lyubimov

It is a matter of common knowledge that thinking ability can be developed to a certain extent just as the body is trained. Sportsmen know that training in gymnastics should start as early as possible and be continued regularly. The same may be said of mental gymnastics which are every bit as important to the state. But the strange thing is that this rates much less attention.

In the main, schools develop mechanical memory in children. Pedagogy almost ignores the more complex forms of thinking. And yet in addition to the usual mathematical problems there are any number of problems in logic, problems mainly requiring intelligence and inventiveness, which could be put to use in training young minds. School science clubs could also

play a big role here. *The children should not only be given a certain amount of knowledge but—and this is most important—they must be taught to think.*

At First Hand

By V. Dzhelepov

Let us consider which of our educational establishments has given us the greatest number of scientists in the fields of nuclear physics, electrotechnique and electrical engineering. The Leningrad Polytechnical Institute is recognized as one such outstanding institution; this is by now actually a historical fact. Men of science known throughout the world, Academicians Alikhanov, Kondratiev, Kikoin, Semyonov, Kostenko, Khariton, Professor Yefremov, the prominent specialist in accelerators, Professor Valter, the authority in dielectrics and many others have come from this institute. All of them are people of talent and bold technical ideas.

How did this come about? The Leningrad Polytechnical Institute has excellent laboratories with first-class equipment. The students hear lectures by eminent scientists and work directly with them from their third year on. I know, for instance, that Academicians Alikhanov and Skobeltsin made a number of discoveries in the institute's laboratories. And their students worked along with them.

All the professors live in the vicinity of the institute, as do the students who are housed in a big dormitory nearby. Academician Ioffe's institute is right across the street, and Academician Semyonov's quite near. Very important, too, is the fact that *students have the opportunity to see the latest apparatus every day and hour, and receive their knowledge directly from "the horse's mouth."* The scientists for their part are seriously interested in getting acquainted with young people and certainly take notice of the most capable among them. But unfortunately what often happens in some schools is that a busy professor must rush from one end of town to the other to deliver his weekly lecture, as it were, on the wing. Then this luminary vanishes and his students see nothing of him until his next lecture.

It is necessary to set up entire "clusters" of research institutions and educational establishments. What is now being done in Novosibirsk can serve as a good example. The talented youth there will be selected directly at school from the outset.

The experience of our best research and educational institutions shows that young talent can come into its own only in the solution of major problems. Another proof of this is the Joint Institute: this system, to which we have been adhering since 1956, has invariably justified itself. But what have we accomplished here? We have merely given the young people independence. The professors have their own groups, and the young scientists their own. In the majority of cases our best contributions have come precisely from the young but already experienced scientists. A man can grow on the big jobs but not on the petty ones!

Confidence

By B. Pontecorvo

How should talented men of science be trained? This was always a difficult question, but now it has become even more complex. The problem was simpler in the old days when science was not yet so ramified. I recall the situation prevailing in Italy when I was a student. Only one or two physicists were trained every year. The prospects of remuneration were bad in that country, and if a man specialized in physics it meant that he really loved the science. It was a kind of natural selection. But now thousands upon thousands of specialists are needed and the prospects are not at all bad. Hence the difficulty.

I would like to speak here about confidence in one's own abilities. That is very important. I think that practically all scientists, no matter how brilliant, pass through a period of vacillation when they are not sure of themselves. Even Enrico Fermi experienced many grave doubts when he was 21—I heard this from him much later. Fermi succeeded in finding assurance after working with Born and Ehrenfest. This played a big role in his entire career.

Many scientific workers coming to Moscow from other cities are terrified when they meet Academician Bogolyubov or Academician Landau. They are simply afraid to talk to them. We

must help the youth acquire self-confidence. From this point of view the shifting of young scientists from one institute to another should do them good. Today a young man comes to an institute at the age of 22 and for some reason or other he is expected to remain there until he is 60.

I would also like to say a few words about popular scientific magazines. They are much needed because they can attract young people to science. Unfortunately most if not all of these magazines are not as good as they should be. Prominent scientists are listed on their editorial boards but do not contribute. Here is a case in point. A Moscow physicist was invited to join the editorial board of one such magazine. When he pleaded lack of time he was assured there would be nothing for him to do! And then we wonder why this magazine is only second-rate. There is no need to put 20 academicians on editorial boards. Let's staff them with young, gifted scientists interested in this work. Soon the magazines will gain in interest.

How Will They Look at the Sky?

By Y. Smorodinsky

If we look attentively at the geographical distribution of our science, we shall discover a strange thing. While our country is huge, the territory drawn into the orbit of action of the colleges training physicists and mathematicians is not very big. The country has a population of 209 million, while the areas where these colleges "harvest" talent have at most 20 million. The reserves from which we draw our future scientists are on a level with the average European country.

It is very difficult for a young man in a small Siberian town to become a physicist. Not because anyone forbids him to do so or puts obstacles in his path, or because he has no money for a trip to Moscow. The trouble lies elsewhere: these young people simply do not know that a new kind of physics exists on earth. What they learn in school and what they can read in their libraries is far removed from modern science. The ordinary teenager at school cannot learn how nebulae disperse.

What can we suggest? It is claimed that the circulation of popular scientific magazines is small. That is true enough, and

besides there are too few such magazines. *For a country as large as ours, there should be dozens of them published in all the large centers.* A trip to such a town as Kimry, a half hour's ride from our institute, will reveal that its kiosks do not carry either the magazine *Technology for the Youth* or *Young Technician*. It can be that the future 20th-century Lomonosovs living in Kimry may never have heard that people have been studying such problems as heredity or discovering new elementary particles.

Just how, I ask you, will they be able to look at the sky in Kimry?

We have no cheap telescopes. We are still manufacturing erector sets which were considered the height of perfection about fifty years ago but which will teach the children nothing timely.

We must see to it that the elementary telescope, the transistor set for investigating radio waves, the primitive little set for the study of the polarization of light are made available cheaply anywhere. It is not so difficult to organize their manufacture out of waste products. This is a realistic basis for helping people develop and grow for the world of future science.

Finally there is the question of the "canal." It is difficult to arrange for all the teachers in the provinces to come to Moscow regularly for advanced study. But the opposite approach is also important: scientists from the capital should visit other cities and other institutes more frequently. They should go for lengthy periods, perhaps a year or two. This will help us to raise all the institutes to the level of modern science while at the same time aiding in the quest for talented people.

Search Everywhere

By K. Tolstov

Our system of college entrance examinations is really amazing. Whether or not a man will specialize in science is decided in the day or two during which he is passing his exams. Here the element of chance, a teacher's weariness, the applicant's fright, all play a role. Now this too is interesting (and has been mentioned in *Izvestia*): once a man has been admitted to college, everything is done to "pull him through" even if he is totally unfit for the particular field of activity he has chosen.

It seems to me that twice as many students as required should be admitted to the first year so that the most capable ones might be selected later, in the course of their studies. The others should be given the opportunity to find themselves. They may become students of some other department than the one of their original choice or they may switch to another college. Incidentally, colleges, at least the big ones, should be allowed to admit students from other schools to the second or third year.

It has already been mentioned critically that advanced science is concentrated in such institutions as the Leningrad Polytechnical Institute. But we are unable at present to set up powerful research centers at every college.

A flow from the periphery to the leading colleges should therefore be organized and the most capable students chosen. This should be done even if they are less well prepared, just so long as they possess great potentialities. Persons like that are to be found in production too—in factory laboratories, in designing and technological bureaus.

The strength of our school system lies in its contact with life. I believe that creative science should be more boldly introduced into our curricula. Children should be made to feel that science is a flaming process, that men of science are something more than dried-up old sticks or "villains" inventing formulas to cause them to get poor marks.

The road of developing talents through "special" schools is a wrong road. It is difficult there to avoid the influence of loving parents who will be hiring private tutors to coach their "gifted youngsters." No, we raise the standard of education in all our schools so that real talent may blossom everywhere.

The strength of Soviet science lies in its massiveness. We must not deprive ourselves of this advantage.

A Radical View

By A. Tyapkin

I want to voice what may be considered an "extreme" viewpoint: postgraduate study is a very poor means of training first-rate specialists. It is wrong to divide the young workers in scientific institutions into two categories. Now some declare,

"I want to be a scientist" and enter postgraduate courses while others merely stay on as scientific personnel.

Enrollment in a postgraduate course indicates a person's desires and intentions rather than his capabilities.

We at the Joint Institute have recently adopted certain "Rules for Competitors." At first glance these closely resemble the accepted rules on postgraduate applicants. But there is one clause that fundamentally alters the whole thing: only those are admitted to competitions who have a sufficient number of scientific works to their credit. This is no longer "a pig in a poke." A man works in a laboratory as an ordinary scientific worker. He submits his work. If the commission considers that he deserves it, he is credited with a post-graduation minimum and is given the opportunity of writing a major work summarizing his research.

This experiment deserves to be repeated at all scientific institutions throughout the country, including our humanities colleges.

Continuing Research

By V. Solovyov

A more or less active selection of capable young people is being made at our colleges. In the research institutes the selection is usually passive. It ends before it has really started, the moment the young hopeful has joined the staff.

It is common knowledge that in the West a scientist may work five or six years without permanent employment: he is constantly on the move from one laboratory to another. This system, of course, has many weaknesses. I have had occasion to speak with such scientists. They complain about the impossibility of finding work at a good institute and suffer from a sense of insecurity. On the other hand those fortunate ones who strike it lucky acquire excellent even if severe schooling during their years of wandering.

The second question concerns the connection between training and science. Here is an average case: a young man on completing his postgraduate course goes to work at some peripheral college. During the first two years he carefully prepares for his

lectures. Then, loaded down with too many teaching hours, he settles down and starts his lecture course. But science, in the meantime, has gone forward and he is no longer able to find his bearings in a maze of new material. He becomes frightened and goes back to the problem he once studied at his alma mater. He then comes to the end of his rope and he is through. . . . About two years ago several workers from our laboratory happened to attend an inter-college conference at Uzhgorod at which representatives of respectable universities were gathered. We were amazed to see the low standard of many of the papers read at that conference.

The summer schools Professor Meshcheryakov has referred to here may prove very useful of course. But this is not enough. Summer schools are after all only a way of listening to science. What is really important is to give college teachers at regular intervals the opportunity of going to a research institute for six months or a year so that they may do some serious research, reestablish scientific contacts, and have a chance really to emerge in the front line of science.

A Common Goal

By E. Katz

Ours is an international institute. Hence the problem of selection of talent becomes an international one too. We speak different languages but have common interests. All this leads me to raise a couple of points which have been on my mind.

The first one is this: to the Soviet members of the staff a worker from abroad is a "given" man, he is already hand-picked. They reason: if he has been chosen, it must mean it has already been decided that he is to become a scientist. Therefore it is up to us to help him. But the question is, is this always right? Capable young people exist in every country, but sometimes mistakes are made. And if by mistake a weak student has been sent to you, bear in mind that there is always someone else to take his place. Excessive gentleness is uncalled for in such cases.

A person who has specialized within the Soviet Union is regarded with particular respect elsewhere. Should he then do

poor work, the fact that he might have lacked talent in the first place will not be taken into consideration. It is his teachers who will be blamed. Hence the principles of selection should be equally applied to everyone. Of course help should be given. But if a man's work is not up to the standards of the institution to which he has been sent, this too should be recognized. If on the other hand he is capable, he should be cherished.

My second point is that when a man of science is being trained, attention should be paid not only to his specialized training but to his social character as well. Of course those fit for social work usually take up social work while those with a scientific bent go into science. But it must be remembered that a scientist always belongs to society. We know there is a difference in the standards of social development between the Soviet Union and our countries, a difference stemming from the fact that the Soviet people have already had long years of experience with socialism while our peoples lived under capitalism or even feudalism. The class struggle in our countries continues, and it is particularly acute in the sphere of ideology. To us therefore all this has special significance.

Talent Helps Science

By D. Blokhintsev

In the matter of training young scientists, things are not bad at all here. Suffice it to say that the creation of our entire nuclear science has been in the hands of young scientists. So we have both fine young people here and an open road to science for them. But we are moving forward and what we have already accomplished is not enough for us. This explains the ardor of our discussion.

There are some aspects to the problem which trouble me too. One day a group of young people came to see me. They were capable young men whom we had selected ourselves. In a frank conversation they complained that they got little attention, that they had no plan for raising their qualifications, that they had been left to themselves. One of them even said, "There is no stick over us."

I was rather shocked. Fortunately, this proved to be an

"infantile disorder" and today many of these young people have distinguished themselves, have become noted researchers and even laureates. But at that time I had to convince them that they were on the wrong track. I had to do it and Professor Alexander Sergeyevich Davydov also had to do it. They asked us to tell them how we had studied. And they were surprised to hear that we had not been assigned themes for our dissertations.

Davydov and I studied under Igor Yevgenyevich Tamm. He is a true teacher in the highest sense of the word. He was always ready to help us. But to get that help we had to come to him with our own ideas, projects, perplexities. He guided us by advice and criticism. It would have been absurd to expect him to present us with "ready-made" themes.

Unfortunately, both school and college poorly prepare the youth for independent action. Young people do not get into the habit of fighting for a set aim. Why should they? A man is born (no credit is due him for this, is it?), then finds himself in nursery school, then kindergarten, then at school. He has nothing much to worry about. This breeds carelessness.

The worst thing about it all is that at college too many a youth still feels himself a schoolboy. He is expected to read textbooks, to pass tests, attend compulsory lectures and least of all to show independence. In this manner he is taught so "much" that he leaves college a stuffed fish. People may have various ideas about the stuffing but one thing is certain: the fish cannot swim. Then such a fish comes to a research institute and demands more "care": it wants to be in pickled sauce.

I agree with Professor Smorodinsky. We draw on very limited sources for scientific workers. Nor do we train them properly, as I have just tried to demonstrate. And if we get good results notwithstanding, how wonderful will our success be when we overcome these weaknesses!

Now I should like to tell you of some of the innovations we have introduced at the Joint Institute. We have set up an affiliated branch of Moscow University. Senior student physicists will live here, attend lectures and work in our laboratories. Teaching will thus be combined with creative science. The rector of the university has warmly welcomed the idea and is about to establish similar branches in other departments. This, to my view, is a promising road.

We have worked out new rules on competitors as already

mentioned. It often happens that a man who has achieved a good deal in science has no opportunity to defend a thesis, while others with much less to their credit can do so easily. So we have decided to back first of all those workers who by actual work have proved their abilities. Incidentally we also take credit for the following: we have succeeded in securing a doctor's degree even for people who do not possess a bachelor's degree. Such persons are true scientists, gifted researchers; but what labors this "tank attack" on the Higher Certifying Commission has cost us!

Another important matter: so-called sectors have been abolished at the Joint Institute. We are, I think, the only institute in the Union without heads of laboratories. We have scientific groups set up for the solution of this or that problem. A group may exist for six months or a year. It may be headed by an academician or by a young scientist. As a result we have secured greater maneuverability and have given our youth a greater degree of independence.

It is good that our press has raised this very important question of the road of the young toward science. It would also be good if *Izvestia* made this the subject of something more than a short campaign. This is a big, important problem and newspapers can be of great help here.

The Future Soviet City

City planning has recently been among the most frequently discussed subjects in Soviet newspapers and periodicals. The articles presented here (slightly abridged) examine various aspects of this subject—standardization versus diversity, size of housing units, combining residential and public service facilities, and the city's color pattern. The first article is by the Deputy Chief of the City Planning and Building Department of the USSR State Committee on Construction; the authors of the other articles are architects. The first and third articles are taken from *Nauka i Zhizn*, 1960, No. 9; the second is from *Nedelya*, December 25, 1960.

Designing Beautiful Cities

By B. Svetlichny

The town beautiful is not a whim, a fancy or a luxury. To us it has become an organic and necessary condition of life. Everyone responds to beauty and there is no question but that fine, simple architectural surroundings will help develop our people's artistic taste, raise their level of culture and give them a constant sense of esthetic satisfaction and pleasure.

Standardization and the Ensemble

The architecture of our new cities must be beautiful and simple and it must also add to the convenience of the home. "Everything for man, for the sake of his welfare!" should become the slogan of our builders. Soviet urban planning and building are now dedicated to this goal.

A city's architecture begins with the home itself, where a person spends almost half of his life. The internal planning of a residential building must be convenient, simple and attractive. However, the conception of a person's living quarters need not be limited to his apartment. It includes also the adjoining court-

yard, the garden, the area of the entire block where he relaxes after his day's work, and where his children play and grow. There must be ample space allowed for kindergartens and schools, stores, dining rooms and repair shops. All these buildings must be skillfully and harmoniously combined into a single composition creating warm and picturesque internal ensembles. This is no easy task: apartment houses and public buildings are built in our country according to standard plans which are repeated tens and hundreds of times, and this entails the danger of creating uniform and monotonous residential sections.

Many persons feared that with the development of standard projects there would be an end to all artistic creative work, the possibility of designing beautiful towns and highly artistic compositions in cities would vanish. Such an attitude gave rise to a feeling of irresponsibility in the matter of city planning, to careless and mechanical arrangements of standard residential buildings without any ideas behind them.

Formal, trite application of standard plans arouses the people's justifiable disapproval and compromises the very idea of a standardized project, the main object of which is to provide, in shortest possible order, convenient and good living quarters for all our people.

But how can we attain colorfulness and originality with standard projects? Can standard houses result in a city or residential district having a face all of its own? It seems that they can. Here is an example. The town of Angarsk was built almost completely with standard houses. But look how much originality, comfort and individuality it possesses! The same may be said of Novaya Kakhovka, Rustavi, Kotla Kharva and many other young cities in our country.

By what means was this achieved?

Much depends on merging the architecture with the natural environment, combining it with vegetation.

A clever architect-town builder makes skillful use of the specific characteristics of the environment, background and plant life, he skillfully selects the site for each future construction job and lovingly and thoughtfully takes into account everything, including the special features of climate and sunlight.

But architecture is a difficult art. And of course it is not only a matter of relying upon nature: the landscape is the architect's good assistant, but there is still the problem of design.

A Difficult Job

Before the war as well as in recent years there has been much talk about the necessity of creating integral architectural ensembles. For all the effort that has gone into planning, however, the long-awaited ensembles never saw the light of day. And strange as it may be, it was precisely standardization that finally helped create ensembles in our cities, the very same standardization which so many had feared and which, it seemed, spelled the end of architectural creation.

Thus common composition, uniform building dimensions, a simple and calm rhythm, all of which help create a single compositional whole, are characteristic of the large clusters of standard houses in the Pestchany district in Moscow.

What is the secret of the success of such projects? Several years before the last war two large thoroughfares—Pervaya Meshchanskaya Ulitsa (now Prospekt Mira) and Mozhaiskoye Shosse (now Kutuzovsky Prospekt)—were being built in Moscow. Our most eminent architects took part in this work with the aim of turning these streets into the loveliest of the city's thoroughfares. But the idea failed. The mistake lay in the fact that every architect tried his best for himself without paying the slightest attention to his neighbor. Imagine an orchestra in which every musician tries to drown out the others, attempting only to show to advantage his own instrument and his own skill. Nothing can come from such an orchestra except dissonance and cacophony. The same may be said of architecture. The face of a city is not created by a single person but by the concerted efforts of many people, of whole collectives of architects and builders. Therefore in building cities, to "keep an eye" on one's neighbor, to work in harmony with him, is one of the first and obligatory commandments of architecture. That is why, for instance, the Red Square in Moscow and the world-famed ensemble of San Marco Square in Venice are distinguished for their harmony, unity and artistic power, though they evolved in the course of five or six centuries.

Soviet architects are persistently seeking new and ever improved methods of town planning through which, besides offering greater comfort to the people, a city layout of high quality may be evolved. Guided by these demands, we have now rejected the idea of building residential sections in the form of networks of small, closed blocks with mechanical distribution of houses

along their length. We also reject the idea of lining up one house after another on either side of the street like a corridor. Such obsolete methods hinder the creation of good living conditions and are a handicap to the creative architect.

So-called free planning, with buildings placed in picturesque groups around the big garden of a microdistrict, is becoming more and more popular. By laying out the buildings over a large area, the town builder can obtain extremely diversified and effective architectural compositions.

In Quest of Style

There is no denying that the existing standard projects frequently do not stand out for their high merits; sometimes they are over-simplified and primitive. Therefore it is the duty of architects to steadily improve not only the methods of building layout but also the standard plans themselves. Can we attain expressiveness and individuality in a standard house? We certainly can. The newest building materials, which include different kinds of glass and plastics, may be of tremendous help here.

Painting buildings in harmonious tones is also of great importance for eye-appeal and diversity. The first, though we must admit not wholly successful, experience with painting large-panel houses in different colors was that of the Fili-Mazilovo area on the outskirts of Moscow. It showed what color can do even for a section that is dull and monotonous architecturally. Then, too, many different wall surfaces are employed there: smooth, rough, ornamented, with drawings or bas reliefs.

At one time or another each of us, face to face with bold and original ideas in construction, experienced a feeling of admiration and pride for man's inventive genius. It is boldness and unconventionality of design that make a building look modern and original. Skillful combination of buildings of various heights, length and configuration is of tremendous importance.

But that is not all. We must also create a truly Soviet, a socialist style of architecture, a style all our own. The great styles of the past were the result of the creative activities of many generations. Some of them were the culmination of age-old processes of consistent selection and crystallization of the more perfect artistic traits and concrete architectural forms that best conformed to the spirit of a given social era.

A similar process, immeasurably accelerated, is taking place

in our times. We are now witnessing the birth of new esthetic conceptions of Soviet architecture based on high social ideas and broad applications of the latest achievements in science and technology. The vast majority of architects have drawn the correct conclusions from the severe but justified criticism to which they were recently subjected by the Central Committee of the Communist Party. And the first important practical step was the rejection of mechanical imitation of archaic forms, of utterly useless superfluities which boosted construction costs and at times encroached upon man's comfort.

Under what influences then will Soviet architectural styles evolve? What shall determine their specific features and characteristic traits? The first of these influences is housing construction on a mass scale, aimed at creating uniformly comfortable homes for all our citizens. Then there is the question of public buildings, of schools, children's establishments, clubs, motion picture houses. The use of new, factory-produced building materials is also a feature. Finally, the industrialization of construction will make a vast difference.

Our architecture must also be extremely simple, almost classical, attractive and economical.

Characteristic features must be lightness and gracefulness of form, clear and simple composition, well-balanced, lovely proportions and an expressive rhythm of all its parts. We must erect buildings which ensure an abundance of light and air, are distinguished for the simplicity of their finish, and are painted in light, pure, radiant colors.

The Center and the Outskirts

The entire city cannot be consistently beautiful and expressive. Nor is this required. Composition in any art, be it music, literature, painting or architecture, is always based on the interdependence of the primary and the secondary. The most impressive part of a city must be its center, its main streets where public and business life is concentrated and which is therefore visited by the greatest number of people.

The main streets must stand out for their beauty, since they frequently are the "showcase" of the entire city. Wide shop windows made of pure mirror glass and brightly illuminated all through the night, through which the entire store and the goods displayed in it may be seen at a glance; multicolor electrical

advertisements gleaming over the buildings against a background of nocturnal sky; broad, neat sidewalks made of light, easily washable slabs; graceful kiosks and street lamps; the fine finish and colors of buildings; street cafes and restaurants, motion picture houses and photo displays, fountains and monuments—all this can give a city a gay, modern look.

Greenery plays a special role. Architects call it the second architecture: it can soften many of the shortcomings of section layout, dress residential sections in splendid garb and literally transform and ennoble the whole aspect of a city. A green hedge of flowering bushes is an excellent substitute for ugly fences. Broad application of these decorative devices makes it possible to transform our city streets beyond recognition.

But the esthetics of a city spreads far beyond its limits: it starts in the wide spaces of suburban zones, at its far approaches. The suburban zone is a city's vestibule and if the vestibule is ugly the edifice itself cannot be good.

If you happen to have visited Riga you must recall how pleasant it is to enter it: its suburbs are clean and neat. This first favorable impression remains during the entire trip to the center. Or take the Georgian city of Rustavi. It lies like a white pearl amidst the fresh greenery of mountain meadows! It has no dirty suburbs or gloomy approaches. But factory yards, old fences, coal bins, waste lots filled with rubbish, dingy adobes will spoil the impression of a big city!

A beautiful city is like a precious stone: it deserves a graceful setting. Therefore the preservation and improvement of the landscape around our cities must be the object of our constant solicitude.

The outward aspect of a city is a mirror of the people's living standards, their well-being and cultural level. We ourselves create our cities and whether or not they become worthy of our splendid life depends solely on us.

What Will Our Future Cities Look Like?

By A. Obratsov

Some interesting figures were presented at the International Congress of Architects in Moscow. They indicated that humanity would have to build 1.5 times more housing facilities by the end of the century than it had built throughout its entire existence on earth. By the end of the Seven-Year Plan period some 15 million apartment units will have been built in the Soviet Union and of course a corresponding number of schools, kindergartens, motion picture theaters, shops, clubs and other public, cultural and service buildings.

The residential district is one of the chief components of any city or town. If the system of accommodations and services is well planned, the town's main problem may be considered solved. A great number of research and designing institutions are working on projects of residential districts and whole towns. What are the architects', engineers' and builders' conceptions of new cities?

They will not build streets bordered on both sides by houses, nor will there be any residential houses with inner yards and passages. The public, cultural and catering establishments will also be quite different from what they are now.

The complete separation of pedestrian routes from transportation roadways is one of the main principles in planning the town of the future. Neither residential houses nor public or trade establishments will face the thoroughfares. Most of the crossings arranged on different levels will provide for high transport speeds and eliminate the need for stopping traffic.

Residential houses will be built against greenery on grounds especially allotted for the purpose. The building layouts will be independent—that is, the houses will be located so that each can have the benefit of a maximum of natural light. This picturesque layout of buildings among greenery, with grounds for sports and playgrounds and swimming pools, will make residential districts both convenient and attractive.

It is planned to build houses of several types. There will be hotel-type houses designed for bachelors and families of two. Such houses will be integrated with a public service block.

Here residents will be able to have their clothes mended and washed; there will be a small club for rest, dancing, etc. Apartment houses of four to five stories for medium-sized families will be the most frequent type built. And last but not least, there will be houses for large families. These will be two-story cottages.

As the people's working hours grow shorter, their social life will acquire broader scope. Large amateur art groups will appear, sports activities will expand. Work with children of pre-school and school age will gain scope.

That is why adequate solutions of the servicing network problem acquire such importance. In the existing towns and cities this servicing network has, as a rule, evolved historically over a period of time and suffers from a multitude of material drawbacks.

The USSR Academy of Building Construction and Architecture has worked out a new town building system whose underlying principle is systematic development of all forms of servicing, beginning with the simplest ones located directly on the premises of residential houses or groups of houses and stemming out to public centers designed to service the population of entire districts.

A system where each district is divided into residential compounds—microdistricts—with a population of 6,000 to 10,000 has proved to be best. Each microdistrict will have one school, two combined pre-school children's establishments (a kindergarten and a nursery), a food shop, a personal service shop, a cafeteria, club, and building maintenance office. Here the radius of servicing does not exceed 400 meters.

All the residential houses within a microdistrict are to be grouped in smaller compounds with a population of about 2,000 each. Each of these compounds will have its primary servicing post. Delivery services and automatic vending machines will provide the residents with foodstuffs, ready-cooked meals, and semi-prepared food. The residents will be able to relax in the recreation hall, entertain guests and have family affairs and children's celebrations, and to do their own work in the house workshops.

The microdistrict's public and trade center represents the second stage in the servicing system. The location of all public buildings in one spot will be a convenience for the residents. It

will be possible to take care of many chores all at once: to shop, have dinner at the cafeteria, have one's suit mended or pressed—everything will be right at the house.

Besides being convenient, these public and trade centers are also economically efficient both in construction and operation: due to their compactness they involve less of an outlay for communications, roads and other amenities.

There may also be a possibility of combining several institutions in one building. A common assembly hall, common vestibule and cloak room suggest themselves.

By combining the cafeteria and food shop into a single establishment we shall be able to provide them with joint storage facilities and refrigerating plant, to cut down the number of servicing personnel, to have a single manager and bookkeeping office.

The sports grounds and park in which the school is located will adjoin the public center of the microdistrict. Both adults and schoolchildren will be able to use the stadium. Such a solution will permit building a single stadium of really adequate design and dimensions.

It will however be impossible to provide complete servicing of the population through the public center of the microdistrict alone. There will remain a need for large buildings of district and town importance, to house the palaces of culture, motion picture theaters, major department stores, restaurants, etc. These buildings are not intended for everyday servicing. No one goes to a big department store every day; nor does one daily go to the movies or stadium. That is why the servicing radius for such buildings and structures may be made as large as one and a half or two kilometers, to be reached not on foot, but by some type of transport.

These district public and trade centers will cover rather large areas (some six hectares); they are to have convenient approaches and large parking grounds for automobiles. Each center will house a department store, delicatessen shop, cafeteria and restaurant with mechanized preparation of semi-prepared meals, as well as personal service establishments.

It will also be expedient to locate a hotel, a large motion picture theater or picture-and-concert hall nearby. The center will face with one side to the thoroughfare. On the other side

it is desirable to lay out a park which will include the sports compound and cultural and educational buildings.

By applying these new principles for residential district planning and building and by using a multi-stage system of servicing the population we may resolve, to the fullest possible degree, all the contradictions of the contemporary town. Apart from providing all conveniences for the residents, we shall realize considerable savings in materials and funds in the erection and maintenance of these buildings, savings that may run as high as 20%. Of course the point is not only these savings. More important will be the added comfort, beauty and joy that are to come to each city, town, house and home.

The Microdistrict and New Living Conditions

By A. Zhuravlyev and M. Fyodorov

Microdistricts Will Replace Blocks

Even by merely expanding the area of blocks of houses from three or four hectares to twenty, thirty or even more it becomes possible to undertake urban construction along new lines because this provides an opportunity to create large residential sections with numerous cultural and catering establishments, green courtyards and grounds for sports and recreation.

Such a large complex of residential buildings is called a microdistrict.

But the microdistrict is not merely a complex of apartment houses. It is an organic architectural whole where individual buildings are arranged according to general laws of composition.

Take for instance the new microdistrict now under construction in the Tractor Plant District of Chelyabinsk. A rectangular area of about 26 hectares is bounded on all sides by city streets. Through traffic is excluded, the side roads lead only to nearby houses and shops. The buildings themselves have been arranged in such a way that all apartments have an equal amount of sunlight. The school, club, recreation grounds and shops are located amid a green zone in the center of the microdistrict. Thus the tenants can get to any shop or cultural enterprise within a few minutes.

The average microdistrict is planned for approximately 6,000 people. But it may be even larger. Thus a big residential section for 12,000 people is rising near a large park in Noviy Kuzminki, in the southeastern part of Moscow.

Old Living Versus New

To many people in the West the ideal of a comfortable dwelling is a private house with many rooms. "My home is my castle," says the Englishman. This is an eloquent expression of private-property psychology, of goals in bourgeois society. The more rooms a house has, the more household functions may be conducted there, the more comfortable does it look in the eyes of its owner. Drawing rooms, ballrooms, children's rooms, bedrooms, studies, servants' quarters—such is the approximate description of what is considered the ideal house abroad.

Even in our country some people believe that in the future our individual living quarters will be equally spacious. Those who do think so are greatly mistaken.

No doubt in the future our living quarters will be comfortable, since the development of technology and the general high standard of life in our society will ensure every opportunity for this. But the question arises whether there is any need for such an abundance of rooms in an apartment. After all, not many rooms are required for sleeping, rest and some kind of home occupation during one's free time. And is there any need to preserve in the future all the household functions which we now have? We do not think so.

How is the problem of future living conditions to be solved? Only by a consistent development of public catering, of cultural and educational services. Large catering establishments, model dining rooms and cafeterias with better food than can be provided at home, various kinds of shops, universal service agencies—all this will replace the home kitchen and do away with petty household chores. Boarding schools, kindergartens and creches will make our life easier in many ways. Thus there will be no need for individual kitchens, storage rooms, servants' quarters and so on. But there arises another problem. New buildings and technical installations will be required for the large new service premises. Here too architecture must have its say.

The new trend toward organization of services not only leads to the liberation of women from the drudgery of unproduc-

tively spent labor; it also greatly helps to improve the conditions for raising our new generation.

Public education is of special importance in the formation of the man of the future communist society. Under collective methods of upbringing in boarding schools and kindergartens where the children stay all week long except on free days, our children, experiencing the beneficial influence of their coevals, will be brought up from an early age in a spirit of collectivism, receiving at the same time the rudiments of all-sided development of their individual abilities. Extreme individualism and egotism, so frequently characteristic of spoiled children reared in small families, will be eradicated.

The construction of new club premises, gymnasiums and swimming pools, libraries, rooms for music and the arts where people will be able to satisfy all their most varied tastes and inclinations, will eliminate the need for bulky home libraries and other space for individual work at home. In this way new and better forms of public amenities will eliminate the necessity of flats with large numbers of rooms.

Architects Are Looking Forward

Life itself calls for ever new types of living quarters and public buildings which differ both technically and functionally from the old. New buildings combining different functions are already going up: kindergartens together with creches, boarding schools, dance halls, restaurants and so on. A complex of sports facilities is being put up in Tula and Kazan on the model of the Luzhniki sports grounds in Moscow; a complex of scientific institutions is being built in Dubna and Novosibirsk. By combining space for different functions in a single building or group of buildings we gain economically and can create better conveniences. Separate large sports facilities are also being planned. In the young cities of Vorkuta and Norilsk in the Far-North tundra architects and engineers have built large gymnasiums and swimming pools where both children and adults can take up sports.

A new type of living quarters will be developed along the lines of uniting establishments for public use with residential units. This is the trend in many architectural projects represented at the USSR Exhibition of Urban Construction in the spring of 1960.

This problem has been solved in the following way in the project presented by the Special Architectural Designing Office in Moscow: a complex of apartment houses is connected by an arcade in which various enterprises and public services are located. People living in the apartments can go to the dining room, recreation room or service agency through warm hallways. Such a complex, in the opinion of the designers, can already be carried out in an experimental form.

A group of Kiev architects suggests that several types of buildings combining both residential quarters and public premises under a single roof be set up in new microdistricts.

An interesting proposal on the future development of socialist cities was recently advanced by G. Gradov, Corresponding Member of the USSR Academy of Construction and Architecture, who presented to architects the project for a new type of residential area where the public sector considerably exceeds the existing norms. According to this project most of the children will be brought up in kindergartens, creches and boarding schools located near their homes. There are no kitchens in the apartments, at least not what we call kitchens today. These have been replaced by convenient niches with equipment for warming up food. Who will want to cook dinner at home when a rich assortment of dishes to everybody's taste will be obtainable in the dining rooms? The project amply shows that the transfer of some of the household functions from the apartment to public premises will make it possible to solve future problems without increasing construction costs.

Expressionism in Music— Real and Imagined

By Leon Danilevich

At the Congress of Soviet Musicians in April, 1960, there was considerable heated debate on modernist—and more specifically expressionist—tendencies in Soviet music. The debate was sparked by critical discussion of the recently published Volumes II and III of *A History of Russian Soviet Music*. During the debate Iosif Ryzhkin, musician, critic and musicologist, took sharp issue with the author of this article over the latter's defense of Prokofiev, whose work at one time was under indictment as "Western-influenced" and "decadent." Specifically the clash centered around the last opera written by the dean of Soviet composers, the monumental *War and Peace*. Ryzhkin and Danilevich disagreed sharply on the way this work was evaluated in Volume III of the *History*.

The full text of the debate is not available to us, but a brief critical attack on Danilevich by Ryzhkin, published together with Danilevich's longer piece in *Sovetskaya Muzika* (1960, No. 9), makes it abundantly clear that both sides have gone to some lengths to present their opposing viewpoints. Because the Ryzhkin piece is not wholly clear except to those familiar with the entire debate, it is not included here. We mention it, however, since it has served as a springboard for Danilevich's article, which is essentially an analysis not only of the controversial scenes in *War and Peace* but also of other aspects of the expressionism and would-be expressionism of which many outstanding Soviet composers at one time found themselves accused.

It is a must for Soviet musicians to combat the distortions of the modernists. All symptoms of reactionary, anti-realistic esthetics should be relentlessly condemned. Modernism deserves no quarter nor can we afford a liberal, condescending attitude toward it. But neither can we permit the "discovery" of modernism where none exists, since this can only serve to confuse composers, musicians and critics. Far from encouraging, such approaches only retard the development of Soviet music. There was a time when certain critics claimed to have discovered formalistic trends in outstanding works by Prokofiev, Shostako-

vich, Khachaturian and Miaskovsky. By now we have realized how much harm such unsubstantiated accusations can cause.

Iosif Ryzhkin turns once again to expressionism in his reply.

Before dealing with this problem at some length, I should like to counter the points he makes against me.

It is perfectly true that we regard certain musical phenomena in different lights. And while I unreservedly acknowledge Iosif Ryzhkin's right to uphold any view he pleases, I claim the right to disagree with him. Though he has allegedly discovered expressionist tendencies in Sergei Prokofiev's *War and Peace*, I frankly have found none.

"But what if someone else were to discover what Leon Danilevich has failed to see?" asks Ryzhkin rhetorically. I, in turn, would like to counter by asking why he is so sure he has really found this expressionism. To establish the fact would be tantamount to proof. But though Ryzhkin demands the whys and wherefores from others, his own arguments remain unconvincing—a fact that was aired at the April discussions of the Composers' Union. The main reason for this is not that we haven't yet had any comprehensive writings on 20th-century music. To discuss Prokofiev's opera fruitfully one must first and foremost have the opera well in mind, have a correct understanding of its music. Iosif Ryzhkin, in my opinion, has approached this work in a prejudiced, one-sided manner. His "proof" therefore is unsubstantial.

Let us turn for a while from the subject matter of our argument to its methods. In any constructive dispute one must never attribute to one's opponent things he has never said. Nor should one suppress the things he did say. Iosif Ryzhkin claims that only *one* sentence in my article makes any attempt to substantiate my argument. That is not true. In my dispute with him I take nearly a whole page to set forth my views on this question. But Ryzhkin has not deigned to answer any of my premises; thus he is no longer debating but rather evading debate.

Nor can I understand why the author of the rejoinder, instead of launching a serious discussion, becomes involved in refuting a non-existent "theory of expressionism" according to which Eugene Onegin is a "vicious character" and his image an expressionistic one. This is meant as a joke, of course; but I was not its author, not even its co-author. Nothing of the kind was said in my article. Neither that article nor the statement

singled out by Ryzhkin (to the effect that Prokofiev's madmen are not as "terrible" as they seem to him) could have justified him in attributing such ravings to me.

Now let us see whether I distorted Iosif Ryzhkin's ideas about *War and Peace*. In Vol. III of *The History of Russian Soviet Music* he wrote that Prokofiev's opera contains merely "remnant elements" of modernist esthetics ("individual cuts") and that is exactly how I presented his idea: "In my opinion Iosif Ryzhkin is wrong when he tries to discover remnant elements of modernism in this opera."

If anyone considered "the skin" (i.e., the music of Prokofiev) as really marred by expressionism, he would have been prompted to do so only by my opponent. In his article in *Sovetskaya Muzika*, (1958, No. 1, p. 35), on the new production of *War and Peace*, he makes the claim that "an expressionist tendency is clearly revealed and even dominates all the episodes of the eleventh scene depicting the lives of the people." Sic: it even dominates! But these are no "remnant elements"; and it seems that Iosif Ryzhkin has marred the "skin" with cuts of his own making.

Finally, the reader is left in the dark as to what I am supposed to have "distorted" in my report on the discussions (at the Conference of Soviet Musicians in April, 1960—Ed.) and what I was allegedly compelled to admit. I too am left in the dark about this for the simple reason that neither my report nor my article "distorted" or "confessed" anything.

But Iosif Ryzhkin is right in one respect at least: it is perfectly true that I do have my own "tendency." It consists in holding to the views which seem right to me.

Soviet music critics have made some serious mistakes owing to their misunderstanding of how certain modernist tendencies make themselves felt in music. That is why it would be only appropriate to consider more thoroughly just what expressionism really is. Where is it to be found and where is its presence impossible?

* * *

Andrei Bely once claimed that symbolism was "a school of world philosophy," not just an artistic trend. Similar statements have been made by the German expressionists in the literary magazine *Sturm*. Representatives of some of the modernist trends have thus stressed that these were not to be limited to

stylistic or formal methods alone, since both symbolism and expressionism are based on specific philosophic ideas. One cannot but agree with this.

Expressionism, like many other kinds of modernist art, was based on subjective-idealist principles. "The objective world is merely a pretext for the sublimation of the creating subject," wrote G. Martsinsky, one of the theoreticians of this trend. The hypertrophied creative ego of the artist-individualist, his "spiritual world" and "creative pages" are rated higher than reality by the expressionists.

Expressionism as an art was contradictory. Part of it reflected individual protest against the horrors and killings of imperialist war, against bourgeois inhumanity, the monstrous phenomena of bourgeois society. This trend at the same time carried the artist into a world of nightmares and horrors dominated by a sense of doom and blackest pessimism. Significant symptoms of expressionist art are mysticism, pathological imagery and grotesque fantasy.

The expressionists moreover developed their own methods, their own specific techniques, without which they would never have been able to convey the subject matter of their works. Expressionist painting has made wide use of such methods as the distortion of objects and human faces; it has used mixed compositional schemes, extra dynamism in drawing, vivid color splashes, and so on. In the theater, in addition to the specific methods employed by directors and actors, the experiments resorted to special lighting effects, to arrangements of scenes with wide use of inclined planes.

In the period when expressionism began to penetrate music, full conformity between the idea and its expression had not yet been attained. Highly revealing in this respect is Richard Strauss' *Salome* in which the conception, plot and scenery are pervaded with obvious expressionist tendencies. The religious fanaticism of Jokanaan is contrasted with the monstrous, pathological passion of the lush Salome. The sensual elements grow into feverish untrammelled ecstasy, one of the surest earmarks of expressionist art. Strauss however had not yet broken with the traditions of late romanticism. The music of *Salome* is not entirely original in style but its temperament and somber, gripping dynamism clearly reflect the influence of Wagner and Liszt. Indeed this music often clashes with the plot. When the orchestra

sounds the romantic and passionate theme of love accompanying the final soliloquy of the heroine, the music speaks of true poetic love, love for a living man and not for the cold head of the executed prophet. The sensuality of the passages accompanying the famous *Dance of the Seven Veils* never exceeds that of the *Mephisto Waltz*, though the situation in which the father devours his naked daughter with his eyes would seem to call for a different emotional plane. Nevertheless, the music of *Salome* undoubtedly contains some expressionist elements: one could point, for instance, to the oddly harsh modulation "thrusts" poignantly conveying the inner stress of the characters.

Added to this, there is the unnatural strain of certain of the vocal intonations, as well as the orchestration with which Richard Strauss at times lends heightened coloring to an ordinary, routine presentation. In the scene of Jokanaan's execution the orchestral score is exceedingly simple (a series of unisons in E-flat in the bass, with occasional B-flat fifths in the middle register). But its timbre lends the music a morbid, one might say, "physiological" effect.

Salome is thus a series of contradictions between the expressionist tendency and the romantic traditions which in many ways shape the themes, the harmonies and the entire rendition. This kind of contradiction later disappeared from modernist music, for as time went on, expressionism duly received "deeper" and more consistent musical interpretation.

The leader of the new trend became Arnold Schönberg. It was he who composed the ideal expressionist works in their "pure," "classical" form. And that is why a study of Schönberg's works is important for a proper understanding of the ideological, esthetic and stylistic principles of expressionist music.

Arnold Schönberg, as we know, was not only a composer but also a painter. His paintings were widely exhibited and became the subject of an essay by Kandinsky, organizer of the expressionist group known as "Der Blaue Reiter."

Schönberg himself claimed that his paintings expressed the "subtle vibrations of the artist's soul which could find no expression in music; they were suggested not by the outer world, but by the creative activity of the spirit."* This is a typically expres-

*I. Sollertinsky's essay, "Arnold Schönberg," Leningrad, 1934.

sionist formula. It was no accident that Schönberg's paintings were compared with those of Oskar Kokoschka, a prominent representative of so-called "dynamic expressionism" which proclaimed "creative ecstasy" to be the sole aim of art.

The mature Arnold Schönberg was guided in his musical compositions by the esthetics of Schopenhauer, for the composer attributed major importance to the philosopher's thesis: "The composer reveals the deepest essence of the world and gives expression to the most treasured wisdom in a language inaccessible to his reason, exactly as the medium while in a trance may have explanations for things she cannot possibly know anything about in a normal state." Schönberg emotionally quoted these words in his essay *Das Verhältnis zum Text*, published in the collected works released by "Der Blaue Reiter" group.

The themes and plots of a number of Schönberg's works are typical of expressionism. In his monodrama *Erwartung* the music describes the torments of a lonely woman fearing for the fate of her lover. She wanders through the forest by night until she stumbles upon his corpse. This is a so-called musical *Schreiddrama*. In the music drama *Die Glückliche Hand* Schönberg's treatment of tragi-erotic problems is reminiscent of Freud with his modish theory of psychoanalysis.

Striving for fresh media of expression and for adequate subjects, Schönberg broke decisively away from classical principles of musical thought. It was he who arrived at and advocated atonality and athematism and substituted for the old many new principles of musical thought of his own devising. He did not limit himself however to this fundamental "reform" but also introduced such methods as the spoken recitative (*Sprechstimme*) in his *Pierrot Lunaire* and mounting color, characteristic of the expressionist theater as a whole, in *Die Glückliche Hand*.

There is no need to go into the subsequent development of this trend in the works of Schönberg, Alban Berg and others, for we can by now draw two important conclusions: first, that the appearance of expressionism in music, as in the other arts, is indivisibly linked with a set of philosophic and esthetic ideas suggesting the plot and imagery of the work; and second, that expressionist content calls for a corresponding music style and artistic form far removed by their very nature from the stylistic traditions of realism and romanticism.

Expressionism has never played an important role in Soviet art. Although its influence was felt in the early phases of Soviet painting (the *Makovets* group, *The Artists' Workshop* and OST, *The Society of Easel Painters*) and in some theatrical productions (notably at the Moscow Kamerny Theater), its orientation came mainly from the "revolutionary wing" of expressionism abroad.

There have also been some isolated examples of expressionist tendencies in Soviet music, as evidenced by the Tenth Symphony of Nikolai Miaskovsky. "The Tenth Symphony," wrote its composer, "was an answer, unfortunately not a very clear one, to an idea that had been tormenting me for a long time—the idea of conveying the mental upheaval of Eugene in Pushkin's *The Bronze Horseman*." In evidence here were those "profound and tortuous narrows" of subjectivism once described by Boris Asafiev in reference to Miaskovsky, the symphonist. Turning to the monumental conception of Pushkin's poem, the composer concentrated only on a single one of its aspects, which led to the distortion of the musical outline of *The Bronze Horseman*. Eugene's madness came to be the focal idea of the symphony. Miaskovsky mustered all of his creative power to depict an abnormal condition of the human mind, and this could not help but deflect him from the path of realism. The musical language of the work suffered from over-complexity. This was felt in the artificial, strange and angular melodic lines filled with purely chromatic harmonies; it is noteworthy that not a single triad is to be found in the entire score.

Expressionist influences could also be felt in some of the early works of Alexander Krein (the First Symphony and the Piano Sonata) and of Samuel Feinberg (the Sixth Piano Sonata with an Epigraph from Spengler).

Nor did Sergei Prokofiev escape these influences, as may be seen in his works written between 1910 and the late 1920's. I am thinking specifically of the *Scythian* and "barbaric" pages of his scores, particularly of his *Chaldean Invocation* and *Seven, They Are Seven* for tenor solo, chorus and orchestra, written to words by Balmont. "From the very first measure the listener is caught in a hurricane of deafening sound that might well describe a cosmic catastrophe," wrote I. Nestyev about this work. "Prokofiev resorts to a counterpoint buildup of expressive tonal effects: the 'clashing' trills of the brasses, the rumble of the

basses, the glissando of the harp, the tremolo of the percussion instruments and the violin passages ascending, then falling like gusts of wind. It seems as if the most fearful of storms is thundering over the whole of the universe...".* Like Schönberg, Prokofiev did not limit himself to the search for purely musical media; he introduced loud whispering by soloist and chorus, and interwove glissandos into the chorus parts.

All this has been discussed often by our critics. But it has also happened at times that in their search for signs of expressionism they saw only the superficial, purely formalistic similarities between the imagery and situations they were exploring and that which is typical expressionist art. At times they merely ignored the ideas, the esthetic basis of a work of art, its style and musical language. Here is what we find in the second volume of *The History of Russian Soviet Music* on the subject of two episodic characters in Kabalevsky's opera *Colas Breugnon* (I refer now to the madwoman and the grave digger): "These characters, showing traces of expressionism, are alien to the realistic spirit of Rolland's novel." There is no documentation. The statement is not supported by any analysis of the composer's ideas or of the imagery of his music. Only the mental state of the one character, and the profession of the other, seem to have been kept in view, quite as though death and madness belonged solely to the realm of expressionism. Yet a madwoman and a grave digger are also to be found in *Hamlet*.

Now to go back to *War and Peace*. Before we can properly evaluate the episode of the madmen as well as other controversial fragments of Scene Eleven, we must review the scene as a whole. Its isolated parts cannot be adequately understood unless they are considered against the whole background.

Scene Eleven (Moscow captured by the French) is an important link in the dramatic chain of the opera's action, for here the composer has recorded the people's struggle against the invaders of Russian soil.

Conceived on a vast scale, it is made up of a number of minor, fragmentary episodes, the most significant of these being the ones which show the populace. These consistently carry one of the threads of action running throughout the opera.

*I. Nestyev, *Prokofiev*, Music Publishing House, 1957, p. 165.

True enough, Scene Eleven is filled with "horrors"—with executions and madness and the burning of the city. These factors are commented upon in a rather negative tone in the second volume of the *History*: "the tension of horror is constantly mounting." But after all it is no idyl the composer is describing! On the contrary, he has presented a truly tragic and awesome page out of our historic past. Could he then have been expected to bypass the horrors of reality? And yet fear and horror are not the mainspring of his action line. It is not the tension of horror that mounts but the wrath of the people and their resistance to the invader. Indeed as I commented earlier in my article, "The Major Task of Soviet Music Critics," this is the central theme running through the scene, the theme to which everything down to the most casual episodes has been subordinated.

In developing the theme of the people's struggle by means of a vast, musical-dramatic crescendo, Prokofiev underlines the theme's guiding function. This is how he achieves it:

Of the four folk tableaux, the first is rather modest in scale. Only a few characters are involved. Matvei and Dunyasha are seen reading a French decree. This seems like a "peaceful" episode, even to some extent touched with humor—the two struggle with the learned word "municipality." This first folk passage is contrasted with and overshadowed by the next. "Your property shall be protected!" reads Dunyasha; and at that instant some French soldiers go by, laden with loot. We witness the first outburst of popular wrath: "So they're going to protect our property, are they?" The music instantly loses its humorous, homely tone as the leitmotif gloomily, painfully underscores the war and popular suffering.

The first spark has been ignited. In the next tableau we see the crowds of Muscovites who have firmly resolved: "Moscow shall not bow to the enemy. We shall not let him breathe our native Moscow air in peace." This martyred, valiant and austere choral passage seems pervaded with the spirit of Mussorgsky. Heraldng the next, still more intense stage in the development of popular unrest, it is itself exceptionally dynamic. Combining a double three-part element with the principle of dynamic variation, the composer gradually augments the tension until an ominous climax is reached with the cry: "Death, only death in the flames shall they find!"

The third tableau begins after the Pierre Bezukhov episodes. The people make good their oath, put their threat into action. More and more Muscovites come out into the streets—the massing of crowds here is a device for heightening the dramatic intensity. First we hear isolated cries: “The torch, the torch! Let fire be our welcome!” The situation on stage as well as the music are now even more highly charged than in the previous fragment. The tension mounts steadily as the choral passage, “Moscow shall not bow to the enemy!” is reinforced by repetition of the powerful theme we first hear in the orchestral introduction to the scene, a theme that lends heroic stature to the whole.

Finally we have the last and grandest of the popular-epic sections. It is a panorama: Moscow stands in flames. The fire which consumes the city and the flames of the Patriotic War have merged into a single blazing sea. This is followed by two “culminating plateaus”: the symphonic episode so full of tragedy and despair during which Napoleon with his suite is seen striding through the burning city; and the grand concluding chorus of revenge and retribution. That is the final climax of Scene Eleven.

This final part is distinguished for its rich musical coloring. Prokofiev alternates the powerful currents of chorus and orchestra, merging the vast thematic material of his opera. Here we can distinguish the theme of war evolved symphonically by orchestra and chorus, the introduction to Scene Eleven, and Napoleon’s monologue of Scene Nine at the Shevardinsky redoubt, though this is now subordinated to the first (orchestral) climax and the folk melody of the final chorus. The climaxing planes are outstanding for their sonorities, their pathos and the harsh harmonies of their orchestration.

What grounds have we therefore for assuming that the folk scenes just described “clearly reveal and are even dominated by expressionist tendencies,” again to quote Iosif Ryzhkin. The contents of these scenes and of the entire panorama are profoundly patriotic and have nothing whatever in common with the ideas and imagery of expressionism. The music, moreover, for all its unique individuality, is largely kindred to the traditions of Mussorgsky and of Russian song.

Now what about the three madmen? Perhaps it is they who bring modernist elements into the picture? The answer would

be affirmative if this were in fact the culminating episode, as was once claimed. Had that been true we would have to agree that the element of horror overshadows the great truths of life. But there is hardly sufficient reason for such a conclusion. This is not a climax in any true sense nor is it any sort of culmination of horrors.

The madmen appear toward the end of Scene Eleven; they cannot be considered as a musical or dramatic climax, if only because the preceding chorus singing of Moscow in flames is charged with far greater dramatic tension. Following upon the awesome and magnificent tones of the challenging theme of wrath and vengeance voiced by chorus and orchestra, the episode of the madmen merely signals the beginning of a new passage, of a fresh wave. This feeling is intensified by the two climaxing planes that follow. As compared with these impressive "heights," the episode of the madmen does not particularly stand out.

This fragment together with the one following it—the flight of the French theater troupe—are merely steps in the final musical-dramatic crescendo leading into the general climax. They may be said to pour oil on the fires, intensifying the dramatic pitch.

To this I might also add that the portrayal of the madmen in the Prokofiev opera is a far cry from the nightmarish visions to be found in expressionism. These figures might, on the other hand, be compared with the typical "demented ones" found in Russian classics, of whom the Simpleton in *Boris Godunov* is an excellent example. "The poor devils have lost their minds for sorrow," the crowd comments on these characters in *War and Peace*; and the very first phrase chanted by the madmen—"Thrice have they killed me, and thrice have I risen from the dead!"—becomes in this context a bold challenge to the forces of evil destruction.

The brief musical characterization given the madmen is free of expressionist features. The intonations and rhythmic rendition are kindred to those in the song of Varlaam and Missail, *The Sun and Moon Are Dimmed*, in *Boris Godunov* (and hence to the ancient *bylinas* of Svyatoslav used by Mussorgsky). Moreover the folk character of this Prokofiev image is probably the most effective refutation there is of the accusation that his opera is tinged with modernism.

Though I have tried to counter the unfair criticism leveled

at Scene Eleven, I do not imply that it is faultless. It does suffer from excessive fragmentation and a lack of continuity. The excellently sketched-in characterization of Platon Karatajev is given almost no further musical development and is somehow lost in the mass of material. If the one general plan—the epic folk line—is convincing, the others are too unsubstantial, and the music is of uneven value.

The montage technique of swiftly changing pictures is utilized in Scene Eight (the battlefield of Borodino) and again in Scene Thirteen (the highroad to Smolensk) and once more we find a motley quality and inadequacy of form.

While working on his opera Prokofiev tried to embrace the 1812 epic as broadly as possible. But opera has its limitations. The stage is sometimes overcrowded both with characters and episodes; there is crowding in the score as well. The fragmentary nature of the form is due to a tendency to heighten the vitality of the dramaturgy. This tendency has often produced splendid results in Prokofiev's works. But at times he falls short of the mark. This is unfortunately true in certain scenes in *War and Peace*.

Had the opera conformed to all the canons of the 19th century, no one would have accused the composer of "expressionist exaggeration" or of "modernist fragmentation." But Prokofiev searched for the new and he was right in doing so, for modern opera cannot help differing very essentially from the operas of epochs past. Though he was not successful in everything he attempted, his search for new and more dynamic forms in *Semyon Kotko* and *War and Peace* opened wide vistas to Soviet composers. Despite certain isolated inconsistencies Prokofiev's mature operatic innovations were fully justified.

Russian music has often been marked by a yearning for poignant expression and sharp conflict. This was true of the music of both Tchaikovsky and Mussorgsky. "One should not, however, confuse the expressiveness of Russian music—a deeply Russian phenomenon, fundamentally linked with the forms evolved in a profoundly national trend by the Mighty Five (Balakirev, Mussorgsky, Rimsky-Korsakov, Cesar Cui and Borodin)—with Western European expressionism which is a particular and accomplished style," wrote Boris Asafiev. Then referring to *War and Peace* he remarked that "the intensity of its vocal

dialogues should not be put down to the imitation of the expressionist style.”*

Realistic expression is even more characteristic of modern art when dealing with contemporary conflicts, antagonistic struggles, clashes between the images of war and peace, between humanity and bestial misanthropy. Far from being a weakness, this is the truest strength of our art, since life abounds in phenomena that demand the strongest and most poignant artistic media of expression.

These media have been found by Dmitri Shostakovich in his Fifth, Seventh, Eighth, Tenth and Eleventh Symphonies in which man, or more broadly the people and mankind, are confronted with a socially inimical principle. It would be wrong to accuse the composer of exaggeration under such circumstances, for none exists here.

Morbid modernist art gloats over horrors and fondly imitates the grimaces of life. This is the source of its weakness and the weakness of its advocates and founders. Our art on the other hand is one of health and vitality. It is not afraid of powerful drama, of high tragedy and the bitter antagonisms of social conflicts. It is not afraid of exploring truth, for truth only serves to confirm the profound validity of our communist world outlook.

*B. V. Asafiev, *Essays on Soviet Music; Opera*, The Music Publishing House, 1947, p. 36.

Recipe for the Budding Critic

By R. Uralov

The problem of the critic afraid to "stick his neck out" and anxious to hide behind meaningless but safe and routine verbiage is apparently a sore point with both Soviet writers and sections of the reading public. A leading literary magazine highlights the following contribution in a section devoted to discussion. (*Voprosy Literaturny*, 1960, No. 5.)

Criticism (from *krinein*—to judge, to discern) is the art of judging or evaluating with knowledge and propriety the beauties and faults of works of art or literature, or an essay analyzing and appraising a scientific paper or work of art (particularly if new).

The *critic* (from the Latin *criticus*, or Greek *kritikos*) is a person able to give a reasoned opinion on any work of art, involving a judgment of its value.

The Great Soviet Encyclopedia

So now we know the exact meaning of the word *criticism*. We have long had a fair notion of what a critic was. What we have never given enough thought to is what criticism *should be*—what *ought to be expected* from the critic.

It is high time we really dealt with this question, time we examined the experiences we have amassed. For our young people engaged in creative work must be armed with the knowledge they need in order to raise their understanding and their critical attitudes toward art to a higher level. Meaningful examples may be cited in unlimited numbers.

Writing in the literary magazine *Znamya*, E. Knipovitch recently remarked that a critic's contribution is generally as anonymous as folklore. She also compared culture to a multi-stage rocket.

Criticism, the most widespread genre of literary-critical lore, Knipovitch called the first stage of the rocket for it puts the critic in orbit around literature.

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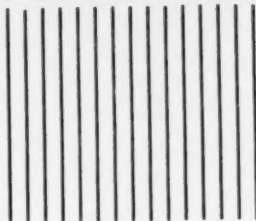
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Like any other lore, criticism is based on tradition, its form and content long subordinated to enduring conventions. It is best to follow these conventions and woe to the heretic who disrespectfully ignores them.

The reader's intelligence must be respected. Therefore present the contents of the book under consideration as glibly as possible. Never worry if you have not read it through. A review of the table of contents will serve nicely. After all, the professional wine taster need not drink the whole barrel submitted for his appraisal: a sip or two will suffice.

What matters is the final judgment, the evaluation, the verdict. This may on rare occasions be either wholly favorable or wholly negative. But better, let the critic's conclusions defy any outright classification as good or bad. Best of all, let them combine praise with censure.

But come what may, the critic must cling to the stock phrases and fossilized expressions, the fixed terminology and insinuations of his craft. Those magic formulations, equivocal and nebulous as they are, never fail to hypnotize the editors and lull the critical faculties of the readers. To wit:

So comprehensive a work cannot receive the detailed evaluation it merits in the space of a brief review...

The brief space allotted this reviewer precludes illustration by direct quotes...

Planted early enough in the text, such reservations will safely relieve the critic of all responsibility. Then, basing himself on the impeccable authority of Kozma Prutkov* himself and citing that sage's profound observation that "it is impossible to embrace the unembraceable," the critic will be safe against the charge that he has skated around sharp corners, skimmed safely over the surface, conveniently ignored the essential point of the work.

These flaws do not detract from the basic value of this book, a talented, well written work deserving both attention and praise...

No matter if the flaws you have pointed out not only do detract from the whole work but are its very meat. The main thing is that you have called the writer talented, labeled his work deserving. You might now add that the book should really

*Kozma Prutkov is a proverbial pompous character fond of delivering himself of vast platitudes which he passes off as profundities.

be published in a second, much larger edition—and you will have completely disarmed the author. This is what is known as a favorable evaluation.

The tone of the whole review depends on the final paragraph, on the final chord, as it were. Actually it is toward this final chord that the whole piece is oriented. The critic, the editors, the publishing house are less interested in the argumentation than in certain final practical conclusions.

There is no denying that as a rule a critical piece is read backwards. This the budding critic must firmly keep in mind. He may avail himself of any one of a number of traditional finales. And while each of these has only a tangential bearing on the contents of any particular review, it is they that make the music.

Version A: *One might doubtless point to various little inaccuracies and omissions. But these are relatively unimportant. The main thing is that Soviet science has been enriched with another important and highly original work...*

Version B: *In conclusion we might add that, all flaws notwithstanding, the readers will doubtless receive this book with sincere gratitude...*

Version C: *But the inaccuracies are the exception rather than the rule and need detract nothing from our general estimation...*

Version D: *Though it is quite possible that the reader may find some rather glaring omissions and shortcomings, these are sure to be few and far between, for on the whole here is a reliable, useful and necessary work...*

And finally: *Not everything is of equal importance here. There are other "little rifts within the Tennyson flute." There are certain inaccurate formulations and equivocal postulates. But on the whole the book deserves positive evaluation.*

Undoubtedly other versions might be cited for there are more of them than there are letters in the alphabet, and all of them are gratifying to critic, author and editor alike. The reader, a rank outsider, deserves no consideration at all even if the review is written for his benefit.

The critic has a more difficult time if, for any one of a number of reasons, he finds it embarrassing to comment on individual inaccuracies, small flaws, incongruities, omissions and minor weaknesses. The truth is dear to all of us, but there are times when it is wisest to run with the hare and hunt with the hounds.

Yet a critique without criticism is as flat as unleavened bread. What can be done about this? A fine way out is to resort to a tried and true method, skillful application of which will create the illusion of criticism, synthetic polemics, a mirage of argument.

Here are some of the accepted versions of this gallant technique:

This book would lose nothing if the author's excursions into history were a trifle broader...

We may assume that the compilers themselves consider this chapter as only a sample...

As for the faults of the book, the most obvious seems to be that of composition and structure. Its chapters have been given vague headings so that it is difficult to tell from the table of contents what actually will be the subject of each of them...

Certain changes in sequence, the deletion of repetitive passages and greater clarity in regard to the general premise would undoubtedly be an improvement...

One might only wish that the author had made his work more accessible in terms of language and methodology. This could have been achieved through more flexible use of its technical paraphernalia...

But if you are forced willy-nilly to make some sort of truly critical statement, one casting doubt on the author's ideas, you had best start hedging at once:

Our differences with the author are purely of a theoretical nature. Indeed they stem entirely from the fact that his research has been as profound as it is thorough and that his ideas are provocative and enchanting for their highly creative approach to the crucial problems of literature today.

This reference to the crucial problems of modern literature is desirable at all times, even if the book under discussion happens to deal with the literary phenomena of the Silurian geological era.

Safest of all, of course, is to limit critical remarks to imperfections in makeup, blaming everything on proofreaders, compositors and makeup men. Here is how this is done:

The book is a mature and meaningful work, fascinating for its content, its language and composition. It is a pity that it has been published in so small an edition, with so many errata, that its paper is poor and its binding unattractive. Nevertheless this

monograph will be acclaimed as a vital work of reference which will prove most useful...

In summing up it is also customary for the reviewer to say a few kind words about the author's potentialities.

If by chance you are dealing with an obviously inconclusive work you might remark: *It would seem that this book is the writer's initial effort in a much vaster project.* And if you are irked by the superficial treatment of important problems you might casually add: *We must assume that these questions will be illumined in the author's future works.*

Need we dwell on the fact that the examples given above are highly useful? Our accredited critics have raised such blank-cartridge marksmanship to a form of high art. There is no denying however that we must learn not by classical example alone. Nuggets of experience should be sifted like gold from tons of dross. We ought to be all the happier then if occasionally we stumble upon a whole slab of bullion!

The relatively short essay, "A New Work on the Theory of the Drama," by the Kiev critic A. Mazurkevitch, published in the magazine *Sovetskaya Ukraina* (1959, No. 12) outweighs many a ponderous volume, representing as it does the quintessence of critical wisdom. While commenting on K. Storchak's book, *Questions of the Prosody of the Drama*, published by the Ukrainian State Publishing House earlier that year, Mazurkevitch delivers himself of the following hyperboles:

We have here a pioneer attempt to explore and theoretically to generalize the problems of poetic forms in drama... The author rather boldly poses and to some extent originally resolves such vital problems as... The author has drawn widely upon the theoretical achievements of his predecessors... Consistently and with conviction our scholar has analyzed... His entire research is marked by minute study of the problems of language as the building materials of the drama... The author has subjected his very varied material to a thoroughgoing and many-sided analysis... This work is interesting for the wealth of problems posed... (It) is of considerable scientific interest... It is a work generalizing practically everything written earlier... Nor will (this book) be interesting to the specialist alone...

Blinded by all these fireworks of delighted superlatives, deafened by the paeans of praise for the author who drew so

widely on the experiences of his predecessors, who will pay attention to a few concluding clichés: the work, it turns out, is *not without certain shortcomings; it would have been desirable to provide deeper and more convincing argumentation; other specific critical remarks might also be in order, if only to help the author continue still more successfully his scientific researches into the theory of the drama . . .*

You may have been ready on Mazurkevitch's say-so to put Storchak on a level with Aristotle and Lessing. But then within a month the magazine *Vitchizna* (1960, No. 1) comes out with a scathing piece by Ivan Svetlichny, "The A, B, C, D, or the 'Development' of the Phrases, Theses and Paragraphs of a Scientific Treatise," dedicated to the celebrated theoretician of the drama himself and also to the Ukrainian State Publishing House and the first reviewer of *Questions of the Prosody of the Drama*, M. Khmelyuk, who anticipated A. Mazurkevitch with an article in the Kiev newspaper, *Radyanska Kultura*.

Whom is the poor reader to believe? Khmelyuk and Mazurkevitch who rocket their colleague to cosmic heights or Ivan Svetlichny who, armed with facts, demonstrates the helplessness and theoretical illiteracy of the treatise on dramatic theory?

The incident is rich in possibilities. But then the reader, able to think for himself, will put down the critical evaluations and turn to Storchak's own book. He will doubtless be overcome by the author's iron logic of which we shall cite only two paragraphs—in our own imperfect translation—dealing with the comic and the tragic in art:

Intent upon killing a fly with a stick, the child makes a comical effort which, in effect, is for him a step in knowing life, a logical step in his development. The function of such an action, which cannot be regarded as a direct stimulus to social development, consists of its inevitability: the child is learning, accumulating experience (p. 221).

And elsewhere we read: *Death is just as inevitable and natural in our life as birth, suffering as steadfast a companion to man as joy. For this inevitable fact—from destruction, death evolving out of life (wherein birth and death are merely the opposite sides of a single process)—tragedy derives its basic conflicts (pp. 109-110).*

Ivan Svetlichny evidently feels that the ability to make a mountain out of a molehill is not what is important—what is

important then is to mine gold from the mountain. And that indeed has been the chief achievement of the method of "development" Storchak uses in his analysis of poetic drama.

Be all that as it may, we do not always do justice to the works of our colleagues, critics included. We are apt to be too niggardly with our praise. After all, critics too are human. They too want a bit of praise now and then.

The Subconscious, Dreams and Intuition: A Materialist View

G. I. Kositsky

Soviet psychiatry and psychology are based on the Pavlovian or strictly physiological approach to all mental phenomena, as against the Freudian which is considered idealist. Here a doctor explores those aspects of human thought processes which have traditionally been viewed as proving that there is something inexplicable, hence mystical and "divine," in the subtler forms of mental manifestations. (*Nauka i Religia*, 1960, No. 9.)

The Thought Process Defined

There is no limit to the creative power of human ideas. Man today sends vehicles into space and creates substances nature has failed to produce. Man probes the microworld, unraveling the mysteries of particles so tiny that a million of them will hardly be as thick as a human hair. Like lightning, human thought takes in vast expanses of space and time. There seems hardly an obstacle it cannot overcome, hardly a secret it cannot penetrate. However, the thought process itself remains the greatest and most enigmatic of all mysteries.

What is the origin of thought? Where does its all-penetrating power come from? These are the questions every man asks himself sooner or later. For centuries people believed thought was a faculty of the soul given to man by God. Its nature appeared unfathomable. But science has irrefutably proved that human thought is the result of nerve cells in the brain being made to react to signals from the outside world. If the receptor organs of man's sensory system are upset, no God can help him.

A patient was brought into a clinic suffering from serious disturbances of the nervous system. All his sensory organs with the exception of one eye and one ear had ceased to function.

As soon as he closed his good eye or lay on his good ear he would immediately fall asleep: his consciousness would become inoperative. Not even if his blanket were pulled off, his bed shaken or a loud noise made in the room would he waken. But if light fell on his sound eye or noise was directed into his sound ear he came to at once. The man was normal mentally—he answered questions when not asleep and was well aware of his grave condition. If, however, the physician covered his eye and ear with his fingers the patient at once lost consciousness and fell asleep again, to remain so as long as the sole channels linking him with the outside world remained disrupted.

A large number of similar observations were made on animals in Academician Pavlov's laboratories.

However, the mind does not merely reflect the outside world like a mirror. While a mirror shows the actual objects as they exist in reality, the brain adds many things to the "image" reflected. These "things" derive from traces of past experiences stored in the brain.

Investigating the functions of the brain, scientists have identified the basic processes occurring in the nerve cells. Although the biochemical aspects of these processes have not yet been fully elucidated, their external manifestations, that is, the interaction of nerve cells and their associations have by now been studied and reproduced with instruments.

Modern computers are capable of simulating the basic elements of cortical activity (excitation and inhibition, temporal relations, memory). There are "intelligent machines" which can play chess, write poetry, translate from one language to another and solve involved equations. Such machines supplant the work of thousands of people. They make those who believe in the divine soul admit that there is nothing divine in our thinking. If there were, they would have to idolize the "soulless" machine, which would virtually mean a return to savagery.

Academician Pavlov's experiments and the findings of present-day science are irrefutable. But the clergy will not accept this. They are afraid of the light of truth and are seeking every pretext to create confusion. Exploiting the fact that the mechanism of the mind and the nature of consciousness are not simple for ordinary people to understand, the church is at pains to prove that the God-given soul does exist. The church is still in a position to gamble on ignorance so as to deceive the

layman, but it is no longer able to hold its own in a serious argument.

"Conditioned reflexes?" the clergy say. "Well, perhaps. But dogs too have them, while the soul is to be found in man alone. No, man does not learn the world through reflexes. He perceives the truth through divine revelation, premonitions and intuition. The truth may present itself in 'prophetic' insights. This is the way the soul communicates with God. Reflexes are irrelevant here, for the phenomena of nature are mysterious, they are beyond man's comprehension. They come from God."

We often hear such reasoning. For premonitions, dreams, and "prophetic insights" do exist; there is a whole gamut of cerebral activity which lies outside consciousness and is not reflected in it. If we fail to comprehend the laws governing this activity we run the risk of permitting ourselves to be poisoned with the drug of religion.

The Conscious and the Subconscious

No matter how involved and diversified thinking may be, it is prompted by environmental factors. Like everything in the world, man's feelings, mental states and thoughts have their own roots. *There is no effect without a cause*: this principle is applicable to all phenomena in nature, including the activity of the brain, which is thinking.

It does happen however that sometimes even the most thorough analysis fails to identify the cause of a thought or of an act. "I had a presentiment about it," most people would say in such cases. For there still exists the belief in "premonition" as something which originates in the mind without any apparent cause and which, in the opinion of the clergy, points to "divine revelation" or to "direct contact" between the "soul" and God.

Let us turn to some experimental facts of modern physiology.

A man is put in a soundproof chamber, Pavlov's "tower of silence." He is asked to place his hand on metal electrodes through which a strong but harmless current may be sent at will. The man will pull his hand back as soon as current passes through the electrodes. Thus, a pain reflex is established—a protective, defensive reaction. Now we shall make our experiment more involved: the current impulse is preceded each time by a faint audio signal sent into the chamber by a suitable de-

vice. The sound is so weak that the man in the chamber is unable to pick it up and thinks there is complete silence in the chamber.

This inaudible signal acts upon the subject each time a current impulse is sent. The combination of sound and current is repeated several dozen times. Then, with the other environmental factors remaining unchanged, only the inaudible signal is switched on. But the man draws his hand back as though he felt an electric shock. When questioned about it, he will say he *thought* there was, or there must have been, current passing through the electrodes. This is a conditioned reflex: the reaction provoked solely by the signal preceding the stimulus. The man believes he heard no sound. The perception of the signal never reached his consciousness, yet it acted upon the nervous system and gave rise to the reaction. This experiment proves that not all stimuli from the outside world can or do reach our consciousness. Nevertheless many weak and apparently unnoticeable stimuli can affect our behavior. For example, the brain controls the activity of the internal organs (heart, liver, spleen, etc.) without any interference from our consciousness. We do not even suspect how sensitive our organism is to changes in the environment, changes which in turn change our mood, thoughts and wishes. This of course is not a case of our consciousness being confined. Quite the opposite is true. If our consciousness were unable to concentrate on some objects or phenomena of the outside world and to ignore the others, our perceptions would be extremely vague, purposeless and chaotic. What we call the "subconscious" is in fact responses to stimuli coming from the outside world but remaining unnoticed, stimuli which reach the mind along with those perceptions of things or phenomena of which we are conscious. This is why any attempt to set the conscious against the subconscious is misunderstanding or misinterpretation of actual reflections of the outside world in the mind.

According to Pavlov consciousness is the nervous activity of a definite point in the cerebral cortex possessing the optimum conductivity at the moment. This point is not fixed; it continuously changes as the incoming stimuli excite other centers in the brain. If we could look through the skull of a normally thinking man, and if the spot with the best conductivity at a given moment could give off light, we would see an irregular spot of light moving about on the cerebral cortex. We would

also see it surrounded by more or less well defined shadows. The shadowed brain sections are those in which nervous activity is of low energy, insufficient to become the basis of thought. This is activity below the threshold of consciousness.

Thus it becomes understandable why not all stimuli from the outside world are comprehended. A number of signals may act upon us to change the activity of our brain, our behavior or thinking, but the causes of such changes will escape our notice. This however does not imply that the causes do not exist. Some of the processes occurring in the brain continue to remain outside the consciousness. For instance, if there is lack of oxygen, a person may faint and fall. We do not perceive the actual "breathing" of the brain, but the lack of oxygen feels like a heavy blow on the head. Nor do we perceive most signals coming to the brain from the internal organs. Some outside factors may also remain unnoticed by our consciousness. This entire realm of the subconscious holds a prominent place in cerebral activity.

Instincts, wishes, inclinations, feelings: what are the laws governing them? Are there in fact any laws here at all? The answer of course is yes.

Instincts and wishes are "obscure" indeed in the sense that they are not always consciously recognized. But they reflect definite biological needs. Sometimes we see children eating chalk as if it were sugar. This is an indication that their body needs calcium salts.

Academicians K. M. Bykov and Chernigovsky and their co-workers have shown that many nerve impulses originate in the internal organs. However, these signals do not as a rule reach consciousness. Physicians know that heart disease may cause depression and fear of death. It is not without reason that a stomach ulcer is said to go hand in hand with "ulcer" of the temper. Affected bile ducts make a person short-tempered while disease of the intestines makes him slack and apathetic. The sick person usually does not realize the causes of all these changes in his mood, character or behavior. However, these changes are so much the rule that many of them have been included in textbooks on diagnostics as subjective symptoms and part of patients' complaints.

The living organism needs a continuous inflow of nutrients to replenish its chemical structure. Any disruption of this inflow gives rise to a number of signals. The nerves linked with per-

ception of the intake of these nutrients become excessively irritable. Thus we have children beginning to eat chalk, pregnant women craving spicy food, and so forth. These are not whims but manifestations of the biological needs of their bodies.

The wishes, actions and behavior in such cases are all strictly motivated.

Sleep and Dreams

Dreams and what we call premonitions are the result of impressions or other stimuli which are not comprehended by man and therefore seem to have no apparent cause—to be supernatural.

But the content of dreams is fully determined by the nature of signals "falling" upon the sleeper during his sleep and by traces of past experiences "stored" in his brain. When we fall asleep the brain does not always cease to function completely. In sleep many of the nerve cells in the cerebral cortex are inhibited to a point where they are immobilized in terms of active work; there is no consciousness for the time being. But try to drag the blanket off the sleeper. He will huddle up, shiver with cold and without waking up pull the blanket back on. He will remember nothing about all this in the morning. But his behavior shows that part of the nerve cells remain active during lighter sleep, perceiving the outside world and producing the required reactions. This nerve cell activity is in fact the cause of dreams. Pulling the blanket off causes the sleeper to see himself bathing in cold water or walking in the rain. Dreams are conditioned by the nature of the stimulus, in this case by the action of cold. Sometimes the sensitivity of brain cells to weak signals increases manyfold during sleep. This is a cause of many so-called prophetic insights.

Dreams can activate traces of what may appear to be forgotten impressions. While awake we would hardly remember them at all. However, the brain never loses any of the impressions left on it during our life span. There are many examples proving this point.

A middle-aged woman suffered apoplexy. She lost consciousness. When she came to, she began to speak in a strange language. The doctors' first thought was that she was delirious. But the patient was able to explain in gestures precisely what she wanted, although she called things by strange names. A

linguist was called in and found she was speaking Greek. The explanation was that as a little girl the woman and her family had lived in Greece, where she learned Greek. After leaving that country the woman had forgotten the language but had retained its knowledge subconsciously.

We do not remember everything that happened to us during childhood. But this is only surface forgetfulness. Under certain conditions vestigial memories may be enlivened in the brain. This is why events and knowledge "lost" to our memory may "re-appear" in our dreams.

Transmission of Thoughts

Continuous transmission of thoughts across distances is a vital part of our social existence. Speech, the written language, the telephone, the radio are all means of transmitting thoughts. A painting communicates the ideas of the painter, a machine—those of its designer. Thoughts may be expressed by means of inventions or through the way chess pieces are set up. You, the reader, learn something of this writer's ideas as you read his article. But these ideas are no longer dependent on him. They can reach you without his intervention.

"Why," you may say, "aren't we now speaking of the possibility of transmitting 'pure thoughts'—without words or gestures, without their materializing in combinations of sounds, characters, paintings?"

But the whole point is there is no such thing as "pure thought" in nature. Even within our consciousness the thought is not "pure"; it is the product of definite material nervous processes occurring in the brain.

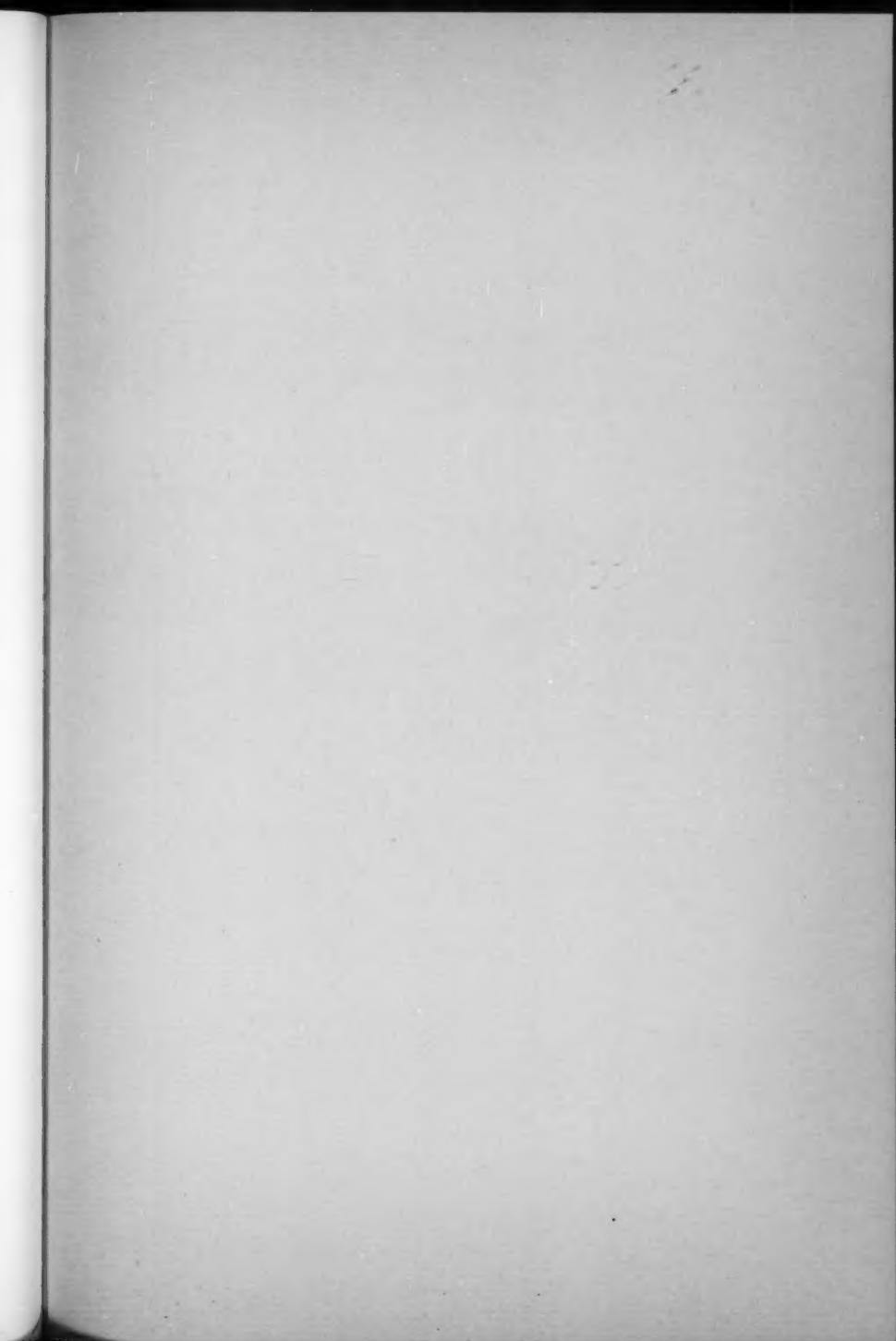
While we do not deny the ideal or spiritual content of our thinking, in the main we disagree with theologists in that we know that human thought is the product of matter—the product of the functioning of the human brain—and occurs only as our environment is reflected in our consciousness. Thought is ideal, not material. But this does not imply that it can exist divorced from matter, from its material carrier—from the word, the signal, the nervous process in the brain. The shadow of an object does not exist without the object which casts the shadow. Yet we cannot possibly equate shadow and object.

In other words, thought cannot exist without its material carrier, but it cannot be reduced to the latter.

What is transmitted from man to man is not "pure thought" but the sound of speech, the printed word, a picture, a gesture or any other signal.

All dreams, thoughts, wishes, moods and acts are caused by signals reaching the brain either from the outside world or from within the body, even though the signals themselves cannot be discerned by the consciousness and we may not be aware of them.

There is not nor can there be a spiritual world without a material world. There is not nor can there be a "soul" outside the body. Science has irrefutably proved that our spiritual world, our "soul," is nothing but consciousness—the result of the reflection of the outside world in our brain.



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